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THE

NATURAL HISTORY

OF

PLANTS.

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VOL. VII.

THE

NATURAL HISTORY

OF

PLANTS.

BY

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VOL. VII.

MELASTOMACEÆ, CORNACEÆ, UMBELLIFERÆ, RUBIACEÆ,
VALERIANACEÆ, DIPSACACEÆ.

LONDON:
L. REEVE & CO., 5, HENRIETTA STREET, COVENT GARDEN.
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LX. MELASTOMACEÆ.

I. MELASTOMA SERIES.

Melastoma (fig. 1–7)[1] has hermaphrodite and regular flowers, the receptacle having the form of a sac with a large superior opening.

Melastoma malabathricum.

Fig. 1. Floriferous branch.

Near the margin of the orifice are inserted externally the sepals generally five in number, twisted[2] in the bud and covered externally,

[1] *Melastoma* Burm. *Fl. Zeyl.* 72.—L. *Gen.* n. 544 (part).—J. *Gen.* 329 (part).—Don. *Mem. Wern. Soc.* iv. 286 (part).—DC. *Prodr.* iii. 144.—Spach, *Suit. à Buffon*, iv. 249.—Endl. *Gen.* n. 6219.—Naud. *Ann. Sc. Nat.* ser. 3, xiii. 272.—B. H. *Gen.* 746, n. 45.—H. Bn. *Payer Fam. Nat.* 356.—Tri. *Melast.* 59, t. 4, fig. 45.—*Acinodendron* L. *Gen.* ed. 1, n. 363 (ex Endl.).—*Grossularia* Plum. (ex J.).

[2] Duchartre describes the calyx of the *Melastomaceæ* as constantly valvate.

as is likewise the receptacle, with hairs or prominences of variable nature.[1] Within are an equal number of alternate, free, symmetrical or unsymmetrical petals, likewise contorted in prefloration.[2] The stamens are interior to the petals and arranged in two verticils.

Melastoma malabathricum.

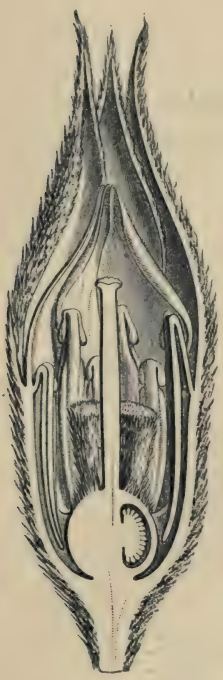

Fig. 2. Long. sect. of bud (½).

Fig. 4. Long. sect. of flower.

Five of them are larger and superposed to the sepals, and five smaller alternate. Their organization is peculiar, each being formed of a filament, at first incurved at the summit,[3] and of an elongate, curved, undulated, introrse, bilocular anther, prolonged at the summit to a

---

[1] Some larger than the others form teeth or rigid hairs alternating exactly with the sepals. On the exterior surface of the receptacle there may be from simple hairs to flattened tongues, dentelate at the margin and each formed of a great number of elongate, fibriform elements bound together at the margins. These are then in some sense prickles.

[2] The torsion of the sepals and that of the petals are normally inverted.

[3] After anthesis the filaments are so displaced as to become all on one side of the flower, and to direct the convexity of their curvature to this same side. This is effected in the stamens inserted on the opposite side by a torsion upon itself of that portion of the filament surmounting the point of insertion.

long tubular beak with an oblique opening at the extremity[1] by which the pollen escapes.[2] In all the stamens will be seen, at the junction of the anther with the filament, two tubercles or horns of variable length, above which, in the larger stamens, is an inferior prolongation of the connective not found in the smaller. In prefloration, all the

Melastoma malabathricum.

Fig. 6 Seed ($\frac{12}{1}$).

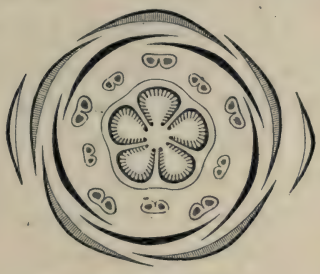

Fig. 3. Diagram.

Fig. 5. Fruit.

Fig. 7. Long. sect. of seed.

stamens have the anther folded back upon the filament so that the summit faces the bottom of the flower occupying one of the small cavities between the base of the receptacle and that of the gynæcium.[3] Between the stamens are seen the walls of separation between these small hollows which connect the receptacle with the ovary. The latter rises free throughout the rest of its extent, and supports a style surrounded by a sort of hairy ruffle,[4] simple, finally curved and exserted, terminating in a small stigmatiferous cupule not enlarged. In the ovary are five alternipetalous cells, in the internal angle of which is inserted a large placenta with a short contracted support and

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[1] This extremity looks directly downwards when in the bud the anther is much inflexed at the top of the filament. Later it is quite superior.

[2] In those of the *Melastomaceæ* where it has been observed the pollen is described as "ellipsoid with three blunt ridges and six folds; in water, oval or spherical with six bands, on three of which a papilla." (H. Mohl, *Ann. Sc. Nat.* ser. 2, iii. 332.)

[3] The origin of these cavities, so common in this family, is that the development of the receptacular tissue in those portions which bind it to the ovary cannot take place in those points occupied by the incurved anther. The bands which separate these cavities from each other are often called partitions, and there is indeed some analogy between the mode in which these partitions are formed and those of many ovaries.

[4] In this genus, as in many others, it is formed of as many scales as there are cells in the ovary, sometimes free, sometimes united to a variable extent, the concavity being opposite the base of the style, covered more or less abundantly with hairs, sometimes accrescent to the summit of the fruit.

covered with anatropous or campylotropous ovules.[1] The fruit is fleshy or coriaceous,[2] finally breaking more or less irregularly and allowing the escape of a large number of small seeds (fig. 6, 7); they are curved or spiral and enclose an embryo likewise curved, fleshy, without albumen, with a conical radicle, nearly equal in length to the cotyledons.[3] There are some species of *Melastoma* whose flowers have six or seven parts. All are woody; they are generally shrubs, of which some forty species have been described.[4] Probably they are much less numerous. All inhabit the Old World, especially the tropical regions of Asia, Oceania, and the islands of the Indian Ocean. Their stems are almost always erect and covered with asperities of variable structure. The leaves are opposite, petiolate, entire, and 5–7-nerved at the base with well developed secondary nervures extending from one extremity of the limb to the other, like the principal nerve, in the form of outwardly convex arcs; a character nearly constant in this family. The flowers are terminal, solitary or in cymes more or less branched, and accompanied by bracts sometimes well developed.

In two Malayan *Melastomas*, of which the genus *Otanthera*[5] has been made, the stamens differ a little in the form of the connective, which prolonged below the anther is accompanied at its base by two tubercles or spurs; but the fruit is that of other Melastomas from which we can separate them only as a section.

Osbeckia is very near *Melastoma;* it is distinguished chiefly by the consistence of its fruit, which is a valvicide capsule with four or five cells. The stamens, moreover, from eight to ten in number, have within the base of the connective two tubercles similar to those of *Melastoma*, but this connective is very little prolonged below the cells of the anther. The plants are natives of Asia, Oceania, and tropical Africa. Their habits and organs of vegetation are, like those of *Melastoma*, very variable. Thus *Dissotis* consists of *Osbeckias* often

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[1] With double envelope.

[2] Its surface, or rather that of the receptacle which envelops it, is covered with the same hairs, scales, or spines seen in the flower and which persist, but growing and becoming more distant from each other as the fruit enlarges.

[3] Equal or somewhat unequal.

[4] Labill. *Sert. Austro-caled.* t. 64.—Wight, *Illustr.* t. 95.—Korth. *Verh. Nat. Gesch.* t. 49.—Thw. *Enum. Pl. Zeyl.* 106.—Miq. *Fl. Ind.-Bat.* i. p. i. 502.—Bl. *Mus. Lugd.-Bat.* i. 50.—Benth. *Fl. Austral.* iii. 292.—*Bot. Reg.* t. 672.—*Bot. Mag.* t. 529, 2241.—Walp. *Rep.* ii. 132; v. 703; *Ann.* ii. 564; iv. 818.—Hook. *Fl. Ind.* ii. 523.—Baker, *Fl. Maurit.* 121.

[5] Bl. *Flora* (1831), 488; *Mus. Lugd.-Bat.* i. 56, t. 20.—Naud. *loc. cit.* xiii. 352.—B. H. *Gen.* 748, n. 43.—Hook. *Fl. Ind.* ii. 522. —*Lachnopodium* Bl. *Mus. Lugd.-Bat.* i. 56.

herbaceous, with the connective more or less prolonged inferiorly and with appendages more or less developed. Some true *Osbeckias* have the flower glabrous or nearly so; and the hairs, when present, are simple and not starred. The same is true of *Nerophita*, the connective of which is scarcely prominent at the base; of *Guyonia*, in which the basilar tubercles totally disappear, so that the filament and connective appear continuous without break. In *O. capitata*, *chinensis*, &c., the hairs are starred and the connective is accompanied by two rather salient horns; but the anthers above are shorter than in the other species. In *Tristemma*, which we make only a section of *Osbeckia*, the habit is nearly that of *Melastoma;* the foot of the connective and its tubercles are a little more prominent than in the true Osbeckias, and the receptacle is bare as in *Guyonia*, though it has some salient transverse rings bearing simple hairs.

Dichætanthera may be defined as *Osbeckia* with simple hairs, short thick and contorted sepals, and stamens, eight to ten in number, with filament at first incurved below the anther sessile on its summit. The latter has within its base two curved horns which are long in *Dichætanthera* proper and short in *Dionychia*. They are shrubs of Madagascar, with knotty branches and flowers disposed in terminal corymbiform cymes.[1]

To one particular tribe (*Acisantherœ*) has been given the name of a genus established by P. Browne in 1756, comprising plants of tropical America, with gynæcium generally free, stamens unequal or nearly equal, ordinarily destitute of starred hairs between the sepals, and a general organization in other respects that of *Osbeckia*. Such are the characters of *Acisanthera*, a congener, in our opinion, of *Tibouchina*, whose name, though more recent,[2] has been preferred, with sepals of nearly the same length as the receptacle, and stamens, to the number of eight or ten, having the connective considerably prolonged at the base, with two interior ascending horns, inserted at the top of the filament. It comprises herbs, often annual, with small opposite leaves, an ovary with 2–5 cells and seeds more or less curved, finely punctuated. Some *Tibouchinas* have stamens dehiscing

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[1] *Dinophora spennevoides*, a shrub of Fernando Po, unknown to us, is distinguished from the preceding genera by its anthers, ten in number, with connective prolonged and dilated at its emarginate base; by its glabrous capsule opening irregularly at maturity. Its leaves are serrulate.

[2] See *Adansonia*, xii. 95.

by a large pore.[1] *Noterophila*, whose staminal pores are small, cannot always be distinguished from *Acisanthera*. Neither can we separate, except as sections, and chiefly by the habit and foliage, a great many genera the flowers of which present no important differences, and are distinguished only by characters of no generic value. Such are: *Comolia*, herbs and shrubs with very variable organs of vegetation, whose stamens are often but slightly unequal, and have sometimes a connective less prolonged below the anther, and furnished with two longer or shorter basilar projections; *Fritzchia*, from South-eastern Brazil, whose receptacle and calix are glabrous and their ovary four-celled; their habit and foliage are those of a *Thymus*; *Marcetia*, from the same country, with glabrous or silky calyx, whose anthers have a connective somewhat thickened outwardly at the base; the leaves are small, often heathlike; they sometimes resemble the *Chamælaucieæ*; *Chætolepis*, whose connective is articulated to the summit of the filament, and its receptacle glabrous or furnished with silky hairs and scales; the habit is that of certain *Labieæ*; *Haplodesmium*, from Venezuela and Columbia, which is *Chætolepis* destitute of accessory appendages between the sepals; *Heeria*, whose tetramerous flowers have eight stamens, the four larger furnished with a long prolongation of the connective; they are herbaceous with flowers solitary or in cymes, and inhabit Guatemala and Mexico; *Microlepis*, small shrubs of southern Brazil, whose flowers are pentamerous with the connective of the ten stamens prolonged anteriorly to a double spur; the leaves are larger, tomentose, and the inflorescence terminal and axillary, compound and many-flowered. *Desmoscelis*, Brazilian herbs or under-shrubs, still more hairy, with simple stem, ten anthers and hairy 5-celled ovary; the connective is furnished

Tibouchina (*Heeria*) *macrostachya*.

Fig. 8. Flower.

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[1] Several types referred to the group of *Microlicieæ* appear to us not generically distinct from *Tibouchina*. Such are *Tulasnea* and *Poteranthera*, which may have the same habit and flower as the true *Acisanthera*, but which have been artificially separated because they have, it is said, a rectilinear ovoid instead of a curved seed. But in *Poteranthera* it is often as much or more curved than in the *Acisanthera* type. This character could not, therefore, have an absolute value. For the same reason we shall also consider *Meissneria*, *Bucquetia*, *Svitramia*, as sections of the genus *Tibouchina*; the two last are scarcely distinct from *Fritzschia* except in the form of their seeds.

with two interior basilar horns, more or less developed according as the stamen is alternipetalous or oppositipetalous; *Pleroma*, hairy shrubs or herbs from the Antilles and tropical America, whose pentamerous flowers are similar to those of *Fritzschia*, with very variable habit and inflorescence; the latter sometimes subcapitate; *Diplostegium*, having the flower of *Pleroma* with bracts forming under the flower a double calycular appendage; *Hephestionia*, inhabiting arid mountains, shrubby, rigid, covered with scaly hairs, the flower always that of *Pleroma*; *Purpurella*, frutescent, hispid, and having all the floral characters of *Pleroma*, with anthers dehiscing by large pores (as in certain true *Acisantheras*); *Macairea*, shrubs from Brazil and Guyana, equally hairy, with tetramerous flowers, collected in terminal and ramified clusters of cymes; *Pterolepis*, herbaceous and frutescent plants, with receptacle and sepals covered with branched hairs; flowers sometimes subcapitate (in other respects very analogous to those of the old-world *Osbeckias*); *Ernestia*, herbs from Peru, Columbia and Brazil, with rather large glandular leaves; flowers of *Acisanthera*, arranged in terminal di- or trichotomous cymes, with the appendages of the connective rather longer and more slender; *Appendicularia*, of Guyana, having the stamens of *Ernestia*, with spikelike inflorescence; *Dichætandra*, which is *Ernestia* with 4–5-merous flowers, but a glabrous ovary; *Nepsera*, inhabiting the shores of the Antilles, Brazil, Columbia and Guyana, and having, with the foliage and inflorescence of *Ernestia*, 4-merous flowers, a 3-celled ovary and a connective with double subulate and shorter appendage; finally *Arthrostemma*, from the Antilles and South America, slender herbs, with the leaves of *Nepsera* or *Ernestia*, but serrulate; flowers grouped in looser cymes, 4-merous, with unequal anthers, furnished with a double horn analogous to that of *Nepsera*. Thus constituted, the very various-

Tibouchina (*Pleroma*) *Gaudichaudiana.*

Fig. 9. Flower.

Tibouchina (*Arthrostemma*) *fragilis.*

Fig. 10. Flower.

formed genus, *Tibouchina*, comprises about two hundred species which grow from the south of Mexico to the south-east of Brazil.

From the above three subgenera, with some hesitation, we separate *Pterogastra*, dichotomous herbs of tropical America, having 4, 5-merous flowers with dimorphous anthers; the connective of the alternipetalous is more prolonged below the anther than that of the others, and may there bear a small appendage wanting in some species. The five angles of the receptacle and the corresponding rib of the sepals are dilated to a verticle dentelate wing, which persists to the fruit.

Aciotis, small herbs of tropical America and the Antilles, has small insignificant flowers, with very slightly-developed calyx. The eight stamens, at first incurved, have a short anther, with apical pore, basilar connective, articulated to the summit of the filament, of which it is continuous, with long obconical and truncated style. The ovary is bilocular, and the fruit membranous and indehiscent.

Brachyotum Benthamianum.

Fig. 11. Flower ($\frac{2}{1}$).

Not materially differing in organization from the preceding types, *Brachyotum* (fig. 11) is immediately distinguished by its 4, 5-merous drooping flowers, the petals of which unite in a false campanulate corolla ordinarily surrounded by imbricate bracts forming a calycule. The stamens have incurved filaments and the two cells of the anthers are prolonged downwards in two short and obtuse appendages. *Brachyotum* comprises shrubs of Columbia, Peru, and Bolivia.

The American plants named *Microlicia*, by Don, have given their name to a tribe (*Microliciæ*), and are distinguished from all the *Tibouchinæ* by the characters of the seed, which is ovoid, oblong, straight or curved, whilst in the *Tibouchineæ* it is more generally cochleate. To these characters we can accord no more than quite a secondary importance. The true *Microlicias* have a tubular receptacle, five sepals of nearly the same length, ten stamens analogous to those of the *Tibouchineæ*, with anthers at the summit more or less

prolonged or dilated, and bearing the pore of dehiscence. The oppositipetalous stamens are smaller than the five others. The ovary is 3–5-celled. The flowers are solitary, axilar or terminal. To this genus we refer as sections: *Rhyncanthera*, the flowers of which are united in clusters of cymes, and have ten stamens but often partly sterile; those remaining fertile numbering from one to six; *Trembleya*, having solitary flowers, ten fertile stamens and 3–5 cells in the ovary. *Lavoisiera*, having most frequently solitary, terminal flowers of large size, with 10 to 15 stamens, and 4 to 8 ovarian cells, but with all the fundamental organization of *Microlicia*.[1]

Microlicia (*Lavoisiera*) *australis*.

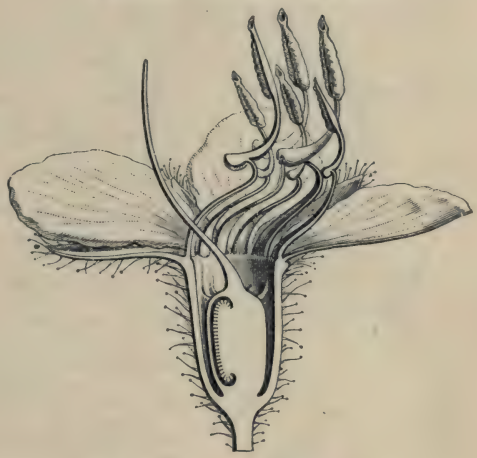

Fig. 12. Long. sect. of flower.

Chætostoma, native of southern Brazil, is hardly separable from *Microlicia* by its floral characters. The stamens have only narrow anthers subulate at the summit. The flowers are ordinarily solitary and terminate branches most frequently[2] clothed with small rigid pointed ericoid leaves. The free ovary is divided into three or four multiovulate cells.

Cambessedesia, a Brazilian shrub, is also very near *Microlicia*. It has the narrow pointed anthers of *Chætostoma*, a 3-celled ovary,

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[1] *Centradenia* (fig. 13) are near *Microlicia*, and are distinguished first by their anthers not prolonged to a beak and by the sepals much shorter than the receptacle. They are tetramerous flowers, and the connective is prolonged below the anther in a curved flattened layer on the back of which is inserted the top of the filament. The ovary is free in its upper half and its summit is bare or surmounted by four teeth. Natives of the southern and western portions of North America, *Centradenia* comprises herbaceous or subshrubby plants with tetragonal or tetrapterous branches, and are remarkable for the inequality of the two leaves of the same pair, one remaining very small or scarcely visible, while the other, very unsymmetrical, is largely developed.

[2] *Stenodon suberosus*, a Brazilian plant, differs entirely by its large foliage and abundant white down, from the other *Chætostomas;* but it is to the latter what *T. Lychnitis* is to the other *Trembleyas*, which has not, however, been separated generically from them.

and a variable foliage, sometimes that of *Chætostoma*, sometimes that nearly of *Microlicia*. In those called *Pyramia* the ovary has four or five cells, and the hairs with which the various parts are covered are starred.

Lithobium, *Castratella*, and *Eriocnema*, with the floral organization of the preceding types, are herbaceous plants, all from tropical America. A common shaft bears at its summit flowers solitary or more generally collected in umbelliform few-flowered cymes. In the former case the flower is trimerous, with six stamens, anthers shortly claviform, emarginate, with connective a little prolonged at the base and destitute of appendage. In *Castratella* the tetramerous flower has eight stamens equally claviform, rounded and enlarged at the summit, with two scarcely marked prominences near the contracted base. The ovary is half adherent; it is free in *Eriocnema*, which has 4, 5-merous flowers with pointed petals and twice as many stamens with narrow elongate anther surmounting an inflexed filament.

Centradenia floribunda.

Fig. 13. Stamens.

In their habit the latter genera closely resemble *Bertolonia* (fig. 14–16), one tribe of which has received the name (*Bertolonieæ*). The receptacle, in the form of a reversed cone, more or less accrescent around the fruit, is often furnished externally with angular prominences or wings (in number 3–9). The calyx is short, formed of five sepals with which alternate as many obtuse contorted petals. There are ten stamens with undulated anthers without appendage; and the ovary, adherent to a variable extent, has three cells surmounted by an equal number of superposed scales, forming an epigynous cupule. The flowers are grouped, at the end of a common shaft, in a scorpioid cyme, often much elongated. From *Bertolonia* we do not separate generically *Salpinga*, having 4, 5-merous flowers and a spur-like prominence below and behind the connective; *Macrocentum*, whose sepals, five in number, are dentelate instead of entire at margin; *Diplarpea*, covered with coarse hairs and having five dentiform

appendages in the intervals between the sepals; *Monolena*, having the stamens furnished with a small interior basilar appendage, and

Bertolonia marmorata.

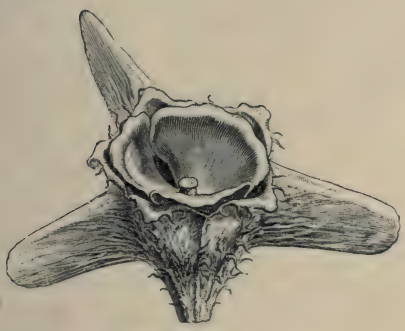

Fig. 15. Fruit.

Fig. 14. Long. sect. of flower.

the style thickened at the base; *Diolena*, in which this appendage is triple, the middle prominence being but little developed, and *Triolena* (fig. 16), in which this middle prominence is nearly (but not constantly) as pronounced as the two others. All these plants are herbaceous perennials, natives of tropical America.

Bertolonia (*Triolena*) *scorpioides.*

Fig. 16. Stamen.

Gravesia is *Bertolonia* with a five- instead of a three-celled ovary. The stamens, equal or slightly unequal, are generally furnished with an anterior or posterior appendage. The flowers are in scorpioid cymes. They are herbaceous or frutescent plants of Madagascar and of tropical western Africa. In *Sonerila* (fig. 17, 18), natives of tropical Asia, the flowers are trimerous, with one or two verticils of three stamens and an ovary with three alternipetalous cells. They are grouped in scorpioid cymes. The same is the case in *Sarcopyramis*, an Indian herb, whose flower is tetramerous, with a large cuplike receptacle; but the terminal cymes are short, capituliform, and surrounded by bracts forming an involucre. The

anthers are bilobed at the summit, with the pore of dehiscence situated at the bottom of the hollow separating the two lobes.

Phyllagathis has also a capitate inflorescence (in reality formed of uniparous cymes), surrounded by an involucre generally formed of large bracts. The flowers, 3, 4-merous and diplostemonous, have a campanulate receptacle and sepals ciliate at the margin, sometimes with alternate rigid hairs. The cells of the pointed elongate and sinuous anthers separate from each other at the base.

Sonerila margaritacea.

Fig. 17. Flower ($\frac{2}{1}$).

Fig. 18. Long. sect. of flower.

Rousseauxia chrysophylla (fig. 19), a shrub of Madagascar, by itself constitutes a small sub-series (*Rousseauxieæ*) which forms a connecting link between *Bertolonieæ* and the following series, *Oxysporeæ*. The flowers, collected in small terminal cymes, are tetramerous, with a campanulate receptacle, and 4 contorted ciliate sepals, 4 alternate petals inversely contorted, and 8 nearly equal stamens, all formed of an incurved filament and an elongate flattened anther, held by its porricide summit in a cavity between the receptacle and the ovary. The latter, adhering thus for about half its height to the internal coat of the receptacular sac, is 4-celled and becomes a capsular fruit.

Rousseauxia chrysophylla.

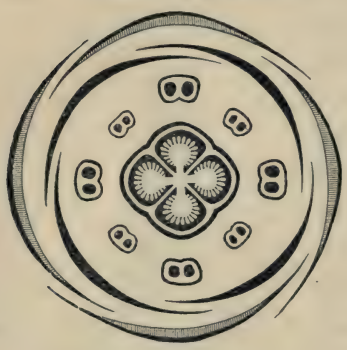

Fig. 19. Diagram.

Oxyspora, the name of which has been given to a sub-series (*Oxysporeæ*), has flowers united in terminal, compound, ramified clusters of cymes. They are tetramerous, with pointed and contorted petals, eight stamens, four of which smaller and alternipetalous may be wanting, whose anthers often have three very small basilar

prominences, two anterior and one posterior. The ovary adheres to the receptacle in the interval between the stamens, and becomes a capsule, the seeds of which are straight, oblong or pyramidal, but not curved. They are shrubs from tropical Asia. In *O. pauciflora* and some kindred species, of which the genus *Allomorphia* has been made, the flowers are smaller but similarly disposed; and the anthers, eight to ten in number, have the two anterior prominences at the base nil or but slightly developed, and the posterior a little more visible. We make this only a section of *Oxyspora*. In *Bredia*, shrubs of China and Japan, the terminal inflorescence is less rich; and the anthers, eight in number, more or less unequal, have one posterior and two anterior basilar prominences; but the latter are somewhat more distinct than in *Oxyspora*. In *Barthea chinensis*, which we refer as a section to the same genus, the anterior prominences are slender and setiform, while the posterior is short and thick; but the rest of the flower is similar. *Blastus* may be defined as *Oxyspora* with axillary inflorescence. The first species of this genus known (fig. 20) had only four alternipetalous stamens, with prominences at the base of the anther almost nil or very indistinct. But others, called *Dreissenia* and *Anerincleistus*, have 8 stamens, 4 of which, often very small, are oppositipetalous. The same is true of *Ochthocharis*, which nearly always has pentamerous flowers, and the posterior prominence of the connective is often somewhat more developed. *Kendrickia Walkeri*, a climbing shrub of Ceylon, connects the preceding genera with *Medinilla*. It has the tetramerous flowers of the latter with 4 obtuse very thick petals, and 8 stamens whose connective is prolonged at the base in a posterior wedge-shaped prominence. The flowers form terminal umbelliform cymes, and the fruit is dry at maturity, while it becomes fleshy in all the following genera.

Blastus parviflorus.

Fig. 20. Flower ($\frac{1}{1}$).

These form a small group (*Medinilleæ*) hitherto raised to the rank of a tribe. *Medinilla* (fig. 21) itself has a truncate calyx surmounting the margin of a receptacle in the form of a sac, purse or gourd,

eight to twelve stamens equal or nearly so, the anthers of which have at the base three glandular prominences more or less developed; two anterior and one posterior. The ovary is in part adherent to the receptacle and becomes a fleshy or pulpy fruit, with rectilinear or slightly reniform seeds. They are erect or climbing shrubs of Asia, Oceania, tropical Africa, and Madagascar. The flowers, often very beautiful, sometimes accompanied by coloured bracts, are disposed in terminal or lateral cymes. To these we annex, as sections, *Carionia*, which has larger flowers in few-flowered cymes, with the calyx furnished with fine narrow tongues, and *Pachycentria*, which has numerous small flowers, with the receptacle more constricted at the throat. *Pogonanthera* (fig. 22), from the Indian Archipelago, with numerous small flowers, closely approaches *Medinilla*, differing only in the connective being without prolongations, and having on its back a bunch of long slender hairs. *Dissochæta*, which has given name to a tribe (*Dissochæteæ*), is *Medinilla*, with stamens ordinarily more unequal. They are usually eight or more rarely four in number. The top of the filament is prolonged in a lanceolate lamina, more or less wide, and the connective often bears two anterior basilar prominences. They are entirely absent in certain species, particularly in *D. Diepenhorstii*, a Javan plant, which has only four stamens with anthers much inflexed, papillaceous on the surface, and with a large foliaceous expansion of the top of the filament (fig. 23). It has been made a genus, *Omphalopus*. In *D. divaricata*, *glauca*, *cyanocarpa*, and other analogous species, the anthers, eight or four, have the form of those of *Omphalopus*, but are smoother on the surface, and the ovary, with four vertical angles along which it adheres to the receptacle, is crowned with four crests more or less prominent. It has been proposed to make a genus also of it under the name of *Anplectrum*. *Creochiton* is diplostemonous

Medinilla javanensis.

Fig. 21. Stamen.

Pogonanthera reflexa.

Fig. 22. Stamen.

Dissochæta, the bud of which is surrounded by two concave and valvate bracts forming an involucre (fig. 24), and *Dalenia*, diplostemonous *Dissochæta* with calyptriform calyx and two anterior prominences of the connective, often slender and setiform. *Sakersia*, from western tropical Africa, is *Dalenia* with pentamerous flowers (having also many characters of certain *Osbeckias*), and *Dicellandra*, climbing shrubs of the same country, have, besides, a small basilar appendage to the connective. All these types with us represent only sections of the genus *Dissochæta*.

Dissochæta (*Omphalopus*) *fallax*.

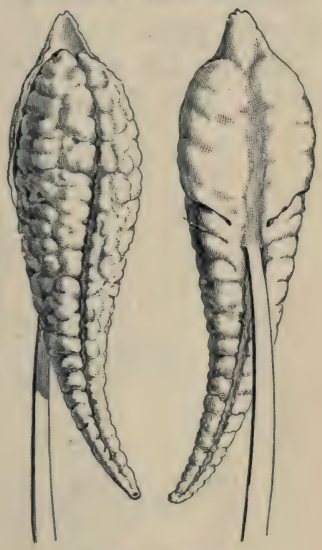

Fig. 23. Stamens.

Marumia (fig. 25), which has many characters in common with the preceding genera (and also with *Melastoma* to which they lead us back), has a tubular receptacle, covered, as are likewise the four thick sepals, with a glandular or feathery down, and eight stamens the connective of which is prolonged at the base and is furnished at the point of union with the filament with two or more long slender filiform hairs. They inhabit the Indian Archipelago, Malaya, and the Philippine isles.

Dissochæta (*Chreochiton*) *bibracteata*.

Fig. 24. Bud, enveloped in its two lateral bracts.

A separate tribe has been made of *Rhexia* (whose name it has received) and of *Monochætum*. In the latter (fig. 26), the tetramerous flowers have eight stamens in two verticils; but the most developed are superposed to the petals. At the back of the connective is a thick claviform appendage. In the alternipetalous stamens, the anther of which is more slender, paler, and less rich in pollen, the dorsal appendage of the connective is longer and much less thick. *Monochætum* comprises Peruvian and Mexican plants. In *Rhexia*, belonging exclusively to North America, the stamens are but slightly unequal and have a dorsal

appendage situated above the insertion of the filament; but this appendage is short and subulate; sometimes even it is almost entirely wanting. In these two genera the anther moreover is elongate, pointed, sessile or nearly so to the top of the filament and opens by an apical pore.

Miconia has also given its name to a tribe (*Miconieæ*) of this family. The flowers are 4–8-merous and the stamens, disposed in two verticils, are slightly unequal, but are most frequently inserted at two different levels. They are exceptionally four or indefinite in number. The filaments are incurved in the bud and the anthers are very variable in form, short or elongate, oblong or linear, subulate, more rarely obovate or cuneiform, dehiscing by one or two apical pores, sometimes by one or two longitudinal clefts. The connective is without any prominence, or dilated at the base, or further prolonged at the sides, within or at the back, in one or two tubercles or auricles. Notwithstanding all these differences, the integrity of this genus, comprising more than three hundred species, has latterly been maintained, because it has been rightly recognized that they were characters of no generic value in such a group. The ovary is adnate to the concavity of the receptacle to a very variable extent, sometimes at the base only, sometimes for nearly the entire height, with all intermediate degrees, and it contains from two to five cells, the anile placenta of which bears a definite (2–8) or more generally an indefinite number of ovules. The fruit is bacciform, but little fleshy, often dry or coriaceous. *Miconia* is exclusively American. The leaves are entire or dentelate, and the branched inflorescence, com-

Marumia muscosa.

Fig. 25. Flower.

posed of cymes or glomerules, is terminal or more rarely axillary or inserted in the side of the branches.

Some *Miconias*, of which a genus *Tetrazygia* has been made, have the calyx campanulate or nearly so, truncate or indented with five teeth at the margin, and an ovary altogether inferior and, it is said, adherent; the flowers are generally rather large. They form only a section of this genus. In others, called *Laceraria*, the calyx opens irregularly at the time of anthesis. By these and some other types, *Miconia* is inseparable from *Pachyanthus*, whose flowers in cymes, generally not numerous, have a superior calyx with five or six divisions furnished externally with an appendage or triangular prominence. *Calycogonium* will also, with us, form a section of the genus *Miconia*. The lobes of the calyx are ordinarily furnished externally with appendages of various form, pointed or tubercular, sometimes nil, and the ovary, depressed at the summit, is inferior. It inhabits the Antilles. *Conostegia* is *Miconia* with compound terminal clusters, often much developed, the flowers having a simple calyx like that of *Laceraria;* but it detaches itself circularly at its base, forming a conical hood. *Pterocladon Sprucei*, a species from eastern Peru, is a *Miconia* with numerous flowers having the external surface of the floral receptacle furnished with five vertical salient layers and the pedicel in the interval between the sepals. The ovary, half adherent, is surmounted by a style with peltate stigmatiferous head, and the throat of the receptacle is salient and more or less crenelate.

Monochætum alpestre.

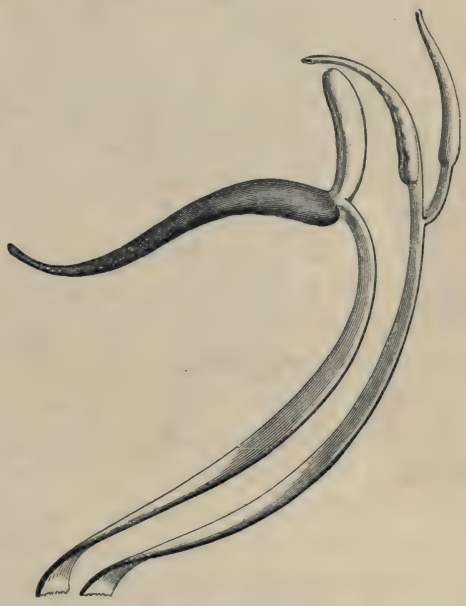

Fig. 26. Stamens ($\frac{8}{1}$).

In the Brazilian *Leandra* the flowers are those of a *Miconia* with the gynæcium nearly free; but they have pointed petals and bracts

forming a sort of involucre around the floral groups.[1] This we can make only a section of *Miconia*. The back of the staminal filament has a short thick prominence at its base; it is more pronounced in another section of the same genus, formed of the single species *Platycentrum clidemioides*, a shrub from Guyana and Trinity. The petals are narrow, rigid, and at first contorted. By this last character this plant connects with the true *Miconia*, *Oxymeris*, whose petals are always pointed and its anthers destitute or nearly so of a dorsal basilar appendage.

Nor, from its close affinity with *Pachyanthus* and *Tetrazygia*, can we separate *Charianthus* from *Miconia*, though it formerly gave name to a separate tribe of this family (*Charianthæ*). The organs of vegetation, the inflorescence, the gourdlike floral receptacle, with ovary entirely adnate to its concavity, are precisely those of some *Miconias*. It is true it is distinguished by its so-called campanulate corolla; it is really polypetalous, with the folioles rather wide and obtuse; that is in fact the only character by which it can be sectionally distinguished.

From *Miconia* may strictly be separated *Anœctocalyx bracteata*, a Cuban shrub, the habit and foliage of which recalls *Octomeris*, and which is distinguished by the inequality (not constant) of its sepals, five or six in number, covered with hairs. The ovary is in greater part free, and the anthers are outwardly recurved. The flowers are in short terminal subcapitate spikes, each occupying the axil of a large concave bract, clothed with hairs like those of the calyx and receptacle.[2]

Here are placed two old genera, established by Aublet in 1775, which in fact differ little from each other. They have often been noticed on account of the large vesicle at the base of the leaves, but this is not constant in the species: they are *Tococa* and *Maieta*, first observed in Guyana, and since found nearly throughout tropical America. In the former, the flower, much resembling that of some *Miconias*, has a tubular or campanulate receptacle, to the bottom of which the ovary adheres for a variable extent, but not entirely. On

[1] There is also an involucre of three bracts around *Pleiochiton*, believed to be Brazilian; it surrounds a triflorous cyme, similar to that of several species of *Pachyanthus*: it is strictly only a section of the genus *Miconia*.

[2] *Catocoryne linnæoides*, a small creeping herb of Peru, said to have the habit of *Anagallis*, with flowers organized like those of *Miconia*. They are solitary or nearly so, with subulate sepals and borne on a sort of terminal shaft, near the middle of which two small bracteoles are inserted.

its margin are inserted five or six short sepals, five or six petals longer and contorted, and ten to twelve stamens nearly equal, the filaments, much incurved, bearing anthers at first reversed and generally provided with a short and thick basilar prominence. The fruit is a berry and the flowers are disposed in terminal ramified groups, clothed with cymes. In *Maieta* (fig. 27), the flowers are axillary and disposed in few-flowered glomerules, each accompanied by four bracteoles; and the ovary is totally adherent. The fruit is coriaceous. But we cannot resist restoring to this genus *Microphysca*, having the same flower, furnished with fine narrow dentelate wings; *Myrmidone*, with leaves equally furnished with a basilar vesicle, and the ovary adherent to a receptacle bearing above five elongate tongues, alternating with the sepals; *Myriaspora*, with an operculiform calyx, sepals somewhat pointed, and an ovary equally adherent,[1] containing 6–10 cells. In *Calophysa*, like the preceding types, native of tropical America, the flower, 3–4-merous, is otherwise that of *Maieta*, and the leaves are also often vesiculiferous at the base; but the inflorescence is sometimes axillary and sometimes terminal, like that of *Tococa;* the sepals are long branched and setiferous. *Clidemia*, another section of the same genus, has the terminal or axillary inflorescence of *Calophysa*, with 5-merous flowers and leaves not vesiculiferous at the base. *Sagræa* is inseparable from *Clidemia;* it has the same organs of vegetation and the same flower; only it is tetramerous and externally bristling with hairs. The inflorescence, terminal or axillary, is in cymes or glomerules, sometimes capituliform and surrounded by an involucre of bracts.

Maieta (*Calophysa*) *pilosa.*

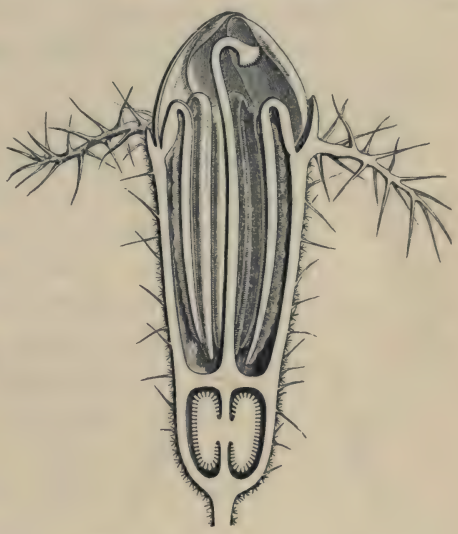

Fig. 27. Long. sect. of bud (§).

[1] It has been considered free only because it has been artificially separated from the coat of the receptacle, as BRONGNIART did with that of *Raspailia*.

Heterotrichum, another section of the same genus, has larger flowers, in terminal cymose clusters, and 6–8-merous, with an adherent ovary, flat or depressed at the summit, and 6–12-celled. The leaves also are nearly those of *Clidemia* and *Sagræa*.

Henriettea is very near the preceding genera; it has lateral flowers, solitary or in glomerules, with ovary completely adherent to the receptacle covered externally with hairs, and anthers inflexed or elongate or shorter in the species constituting the genus *Henriettella*. All are from tropical America.

Ossæa has nearly the flower of *Henriettea*. The 4–5-merous flowers are in clusters of biparous or uniparous cymes, more rarely in axillary glomerules, and the petals approach closely in a cone. In some, forming the genus *Octopleura*, the receptacle has externally eight or ten vertical ribs. These are also tropical American plants. *Mecranium* is from the Antilles, and may be generically distinguished from the preceding types because the 4–5-merous flowers have short and glabrous sepals, obtuse petals, stamens with connective prolonged below the anther, articulate with the top of the filament, and are in ramified clusters of cymes and lateral.[1]

Meriania (Davya) fuscescens.

Fig. 28. Stamen.

A tribe (*Merianieæ*) has received its name from *Meriania* (fig. 28), which has pentamerous flowers, with a tubular receptacle, at the bottom of which is the ovary, free or nearly so, and the margin of which bears five free or united sepals, five longer, contorted petals, and ten nearly equal stamens, the anther, sessile at the top of the filament, bearing posteriorly at its base, an entire appendage, often calcariform, or enlarged and lobed at the summit. The ovary has from three to five multiovulate cells, and the capsular fruit encloses seeds in the form of an elongate pyramid. They are trees of tropical America, with large handsome terminal flowers, solitary or in compound clusters of cymes. From them cannot be separated generically *Adelobotrys*, climbing shrubs which have nearly the same flower with a receptacle often rather more constricted at the throat, and seeds with an envelope prolonged

[1] They at the same time connect, by means of *Loreya*, which they much resemble in their floral organization, this series with that of *Blakea*.

to a sort of wing at the two extremities; *Axinæa*, the receptacle of which is often shorter and wider, but the organization of the rest of the flower is the same, with a thicker dorsal prolongation of the connective, enlarged at the base, and seeds similar to those of *Meriania* proper.

Huberia, Brazilian shrubs, has a lageniform receptacle, with the flower of *Meriania*, but tetramerous; stamens with dorsal appendage less developed, and flowers in cymes. The seeds are winged, whilst they are said to be pyramidal and without wings in *Opisthocentra*, which has tetramerous flowers, in cymes, stamens with posterior spur, like those of *Huberia*, and constitute, therefore, only a section of it.

Meriania (*Davya*) *Claussenii*.

Fig. 29. Flower.

Behuria, glabrous shrubs of Brazil, has the stamens of *Huberia*, to the number of 10 to 12; but the flowers, surrounded by two large foliaceous bracts, have equally large foliaceous serrulate sepals, and five or six relatively little developed petals.[1]

In *Centronia* and *Graffenriedea*, the calyx ordinarily forms a cover which detaches itself circularly at the base or separates irregularly. The former has large flowers in clusters of cymes, with the stamens of *Meriania*, an ovary of 3–8 cells and carpels often bifid at the top, which is prominent. The latter has numerous small flowers (resembling those of some *Lythrariaceæ*) in very ramified clusters; it has eight, ten, twelve, or even a greater number of stamens, equally analogous to those of *Meriania*, and a 2–5-celled ovary. *Calyptrella*, sectionally belonging to it, has the connective somewhat prolonged below the anther. All these plants are from tropical America, and have seeds elongate-pyramidal or nearly so.

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[1] We doubtfully place near *Behuria*, *Urodesmium*, generally referred to the small group of *Rhexieæ*, which appear to us organized nearly like *Huberia*; *Acanthella*, an exceptional type, from the shores of Orinoco, having tetramerous flowers, with a gynæcium supported by a short foot, and flattened seeds surrounded by a circular wing.

II. ASTRONIA SERIES.

The flowers of *Astronia*[1] (fig. 30–34) are regular and hermaphrodite, with a concave cuplike receptacle, in the interior of which the inferior ovary is adnate, above which it is prolonged. In the margin are inserted the perianth and androecium. The calyx is gamosepalous

Astronia macrophylla.

Fig. 31. Fruit (½).

Fig. 30. Long. sect. of flower.

Fig. 32. Long. sect. of fruit.

with 4–8 teeth more or less deep. It not unfrequently divides into unequal lobes,[2] or separates as a single hood.[3] The petals, four or five in number, are obtuse, disposed in contorted prefloration in the bud. The stamens, in number double that of the petals, are but slightly unequal. The short and flat filament is inflexed at the summit, which bears the anther; so that the face of the latter, introrse at anthesis, is turned outwards in prefloration, when it rests on the sides of the style and on the depressed summit of the ovary. The anthers, short and laterally flat, have a dolabriform connective, the base of which is blunt or prolonged in a short and thick projection, and its convex margin, finally interior, bears the two narrow and elongate cells, dehiscing by a longitudinal cleft. The ovary has from two to five alternipetalous cells, surmounted by a cylindrical style with stigmatiferous head nearly entire or divided into as many lobes

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[1] Bl. *Bijdr.* 1080; *Flora* (1831), 526; *Rumphia*, i. 20, t. 6, 7.—DC. *Prodr.* iii. 197.—Naud. *Ann. Sc. Nat.* ser. 3, xii. t. 10; xviii. 257.—Endl. *Gen.* n. 6267.—B. H. *Gen.* 771, n 129.—H. Bn. *Payer Fam. Nat.* 357.—Tri. *Melast.* 151.—Hook. *Fl. Ind.* ii. 550.—*Astronidium* A. Gray, *Unit. St. Explor. Exp. Bot.* i. 576, t. 12 A, B.—*Naudinia* Dcne, ex Tri. *Seem. Fl. Vit.* 86 (not Pl. et Lind.).

[2] In the section *Astronidium*.

[3] In the genus very wrongly distinguished by Decaisne under the name of *Naudinia*.

as there are ovarian cells. In the internal angle of the latter, near the base, is a salient placenta, conical or nearly so, directed obliquely upwards and outwards, covered with anatropous ovules. The fruit is a capsule surrounded by the coriaceous receptacle, which finally bursts and releases the fruit proper. The nervures of the receptacle remain after the decay of the interposed parenchyma, and then form an open network. The seeds are small, numerous, narrow, with basilar hilum and salient raphe. *Astronia* comprises trees and shrubs, glabrous or downy, natives of Malaya and Islands of the Pacific. A dozen species are distinguished.[2] The leaves are opposite, large, coriaceous, entire, trinerved at the base. The flowers[3] are in terminal compound clusters of cymes.

Astronia macrophylla.

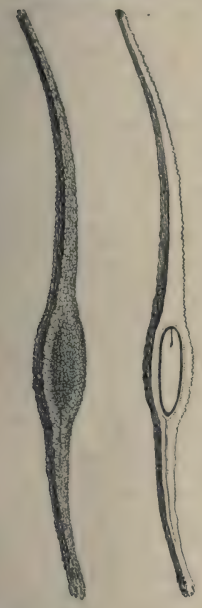

Fig. 33. Seed. Fig. 34. Long. sect.

Pternandra (*Kibessia*) *cordata*.[1]

Fig. 35. Young bud covered with calyx. Fig. 36. Bud with calyx detached.

The fundamental organization of the flower in *Pternandra* (fig. 35–38) is the same as in *Astronia*. It has also a sac-like receptacle of little depth, hemispherical or nearly so, on the straight margin of which are inserted the calyx and petals closely contorted in prefloration, oval or lanceolate, pointed or obtuse at the summit, and the stamens, all nearly equal and formed each of a short subulate filament and an oblong anther obtuse at both ends, with a connective not basally prolonged below the cells, sometimes without appendage, sometimes furnished with a short posterior spur. The top of the ovary is more or less depressed into a hollow which receives the anthers in the bud and which may be covered with a thin layer of glandular tissue with light radiating crests corresponding to the intervals of

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[1] Figures from *Icones Delesserianæ* (v. t. 5).

[2] Rumph. *Herb. Amb.* iv. 134, t. 69 (*Pharmacum*).—Miq. *Fl. Ind.-Bat.* i. p. 1, 566.—Seem. *Fl. Vit.* 85.—Walp. *Rep.* ii. 188; *Ann.* ii. 612; iv. 797, 809.

[3] White or pink, sometimes large.

the anthers. But the flower is tetramerous, and the placentas, instead of occupying the internal angle of the ovarian cells, are situated either very near the base, or, more generally, at a variable height from the external coat. In those called *Kibessia* and hitherto considered generically distinct, but with us constitute only a section of one and the same genus, the calyx is detached as a conical hood, or opens irregularly at the period of anthesis, or even divides regularly above into four shallow lobes. What is more easily distinguished, though it has not, in our opinion, a generic value, is, that the style thickens more and is traversed by ridges more or less marked than in the true *Pternandra*, and that the receptacle is externally clothed with straight or hooked prickles. They are Malayan [1] shrubs with entire and trinerved leaves.

Pternandra (*Kibessia*) *simplex*.

Fig. 37. Flower.

Fig. 38. Long. sect. of flower.

III. BLAKEA SERIES.

Blakea [2] (fig. 39) has given its name to a series in which the ovary is adnate at the bottom of the hemispherical and campanulate receptacular sac, the margin of which supports a persistent calyx of

[1] We have been unable to analyze *Plethiandra Motleyi*, a shrub of Borneo, which, according to the description given of it, approaches the preceding genera, but differs from them by its hexamerous flowers, with 4-celled ovary and stamens numbering thirty.

[2] L. *Gen.* n. 593.—J. *Gen.* 328.—Don, *Mem. Wern. Soc.* iv. 323.—DC. *Prodr.* iii. 195; *Mém.* i. 80.—Endl. *Gen.* n. 6261.—Naud. *Ann. Sc. Nat.* ser. 3, xviii. 142.—B. H. *Gen.* 770, n. 127. Tri. *Melast.* 148.—*Valdesia*, R. et Pav. *Prodr.* 67, t. 11.—*Drepanandrum* Neck. *Elem.* n. 793. —*Pyxidanthus* Naud. *loc. cit.* xviii. 150, t. 6.

five or six valvate or imbricate divisions, and as many alternate petals contorted in the bud. The stamens, double the petals in number, and disposed in two verticils, have free filaments, rather thick, or more slender in the species forming the genus *Topobea*.[1] In the latter the anthers are more elongate and narrower, while in *Blakea* proper they are shorter and wider, dolabriform, with linear cells, corresponding to the internal margin of the connective, but facing outwards when the anther is inflexed on the summit of the filament, and dehiscing by pores or short clefts. The base of the connective is blunt or prolonged in a more or less prominent spur facing upwards in the bud. The summit of the anthers at this period moulds itself in the superior cavity of the depressed ovary which is sometimes covered with a thin glandular layer, belonging to a disk which terminates at the insertion of the filaments. The ovary is adherent in its entire extent and sometimes prolonged at its centre in a conical projection, surmounted by the style. The latter is simple, columniform, with truncate or capitate stigmatiferous extremity, entire or slightly lobed. The ovary is divided into four, five, or six cells, in the internal angle of which is a placenta covered with anatropous ovules; it becomes a fleshy, spongy, or coriaceous indehiscent fruit, enclosing an indefinite number of ovoid, oblong, or subpyramidal seeds, with salient raphe and fleshy embryo, without albumen.

Blakea guianensis.

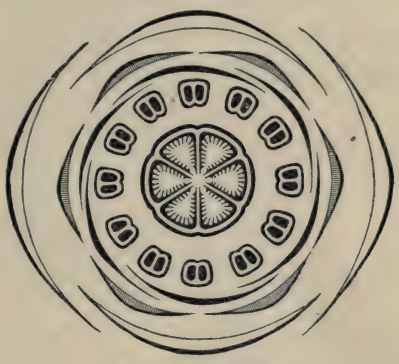

Fig. 39. Diagram.

Bellucia grossularioides.

Fig. 40. Long. sect. of flower.

Blakea consists of shrubs, glabrous or hairy, erect or climbing, with opposite leaves, often large, sometimes very

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[1] Aubl. *Guian.* i. 476, t. 189.—J. *Gen.* 329.—Poir. *Dict.* vii. 700.—Naud. *loc. cit.* xviii. 145, t. 6.—B. H. *Gen.* 770, n. 128.—Tri. *Melast.* 149.

unequal in the same pair,[1] entire, coriaceous, 3–7-nerved, with numerous thin transverse veinules. The flowers[2] are axillary, solitary, pedunculate, or united in cymes, often few-flowered. At the base of the ovary are inserted two (or more rarely three) pairs of decussate bracts forming an involucre round the bud and often also round the fruit. This genus comprises nearly thirty species, all from the tropical regions of the two Americas.

Mouriri Pusa.

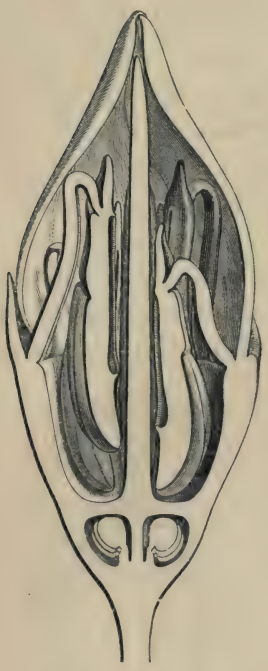

Fig. 41. Long. sect. of bud ($\frac{10}{1}$).

Fig. 42. Long. sect. of flower.

Close beside *Blakea* we place *Bellucia*[3] (fig. 40), native of the same countries and having the same flowers, but without involucre. They are 5–8-merous, and the calyx has the same number of lobes, or forms a hood of a single piece which opens irregularly or is circularly detached at its base. The stamens are those of *Blakea*, and the ovary has from eight to sixteen multiovulate cells. The organs of

[1] As in *B. anisophylla* (*Topobea anisophylla* Tri. *Melast.* 151, n. 18).

[2] Large or moderate, white, pink or red.

[3] Neck. *Elem.* ii. 142.—Naud. *loc. cit.* xvi. 102; xviii. t. 4.—B. H. *Gen.* 768, n. 119.—Tri. *Melast.* 141.—*Apatitia* Desvx. *Ham. Prodr.* 42. —*Ischyranthera* Steud. *Pl. Surin.* (ex. Naud.). —*Axinanthera* Karst. *Linnæa*, xxx. 157.

vegetation are analogous to those of *Blakea*. To this genus we refer as simple sections *Loreya*,[1] having the flowers of *Bellucia*, pentamerous, but smaller, with a truncate or finely dentate calyx, and *Heteroneuron nigricans*,[2] which is a *Loreya* with penninerved leaves darkening more than others by desiccation. Thus conceived, *Bellucia* comprises some fifteen frutescent or arborescent species.[3]

Mouriri[4] (fig. 41, 42), which has been made a tribe of this family, consists of plants, in our view, very near *Bellucia*, particularly to those whose flowers are small and pentamerous, as *Loreya*. They differ essentially only by their ovules. These inserted on a small placenta at the base of the internal angle of the two, three, four or five ovarian cells, are less numerous, collaterally ascending, with the micropyle directed downwards and outwards. In some species only from two to five are found in each cell. The diplostemonous andrœcium is formed of long stamens with inflexed filaments, the anthers of which are formed fundamentally like those of *Bellucia*, with a posterior basilar horn, surmounted by a depressed gland. The fruit is a rounded berry, and the seeds enclose a fleshy embryo, with short radicle and plano-convex cotyledons. *Mouriri* consists of small trees and shrubs from the tropical regions of America. The leaves are opposite, entire, coriaceous, 3-nerved, with nervures often only slightly visible. The flowers[5] are in umbelliform cymes, axillary or united on a small common axis originating in the axil of a leaf. Some thirty species are described.[6]

To the preceding genera we annex *Axinandra*[7] (fig. 43) hitherto referred to another family.[8] It has 5–6-merous flowers, much

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[1] DC. *Prodr.* iii. 178; *Mém.* i. 73.—Endl. *Gen.* n. 6253.—Naud. *loc. cit.* xviii. 109.—B. H. *Gen.* 768, n. 120.—Tri. *Melast.* 142.

[2] Hook. f. *Gen.* 768, n. 121.

[3] Aubl. *Guian.* 420, 421, t. 163, 164 (*Melastoma*), 525, t. 210 (*Blakea*).—Seem. *Voy. Herald, Bot.* 122, t. 26.—Don, *Mem. Wern. Soc.* iv. 326 (*Blakea*).—Karst. *Fl. Columb.* i. t. 87 (*Axinanthera*).—Miq. *Linnæa*, xviii. 619.

[4] Aubl. *Guian.* i. 452, t. 180.—Lamk. *Ill.* t. 360.—Poir. *Dict.* iv. 334.—*Petaloma* Sw. *Prodr.* 73; *Fl. Ind. Occ.* ii. 831, t. 14.—*Mouriria* J. *Gen.* 320.—DC. *Prodr.* iii. 7.—Endl. *Gen.* n. 6270.—Naud. *Ann. Sc. Nat.* ser. 3, xii. t. 10; xviii. 282.—H. Bn. *Payer Fam. Nat.* 357.—B. H. *Gen.* 772, n. 133.—Tri. *Melast.* 153.—*Olisbea* DC. *Prodr.* iii. 31.—*Guildingia* Hook. *Bot. Misc.* i. 122, t. 30.

[5] Small, white, pink or yellowish.

[6] Miq. *Linnæa*, xviii. 290; *St. Surin.* 42, t. 11.—Tuss. *Fl. Ant.* iv. t. 37.—Benth. *Hook. Journ. Bot.* ii. 24, 316; *Sulph.* 97, t. 36.—Griseb. *Cat. Pl. Cub.* 92, 183; *Pl. Wright.* 183.—Hook. *Ic. Pl.* t. 515 (*Mouriria*).—Walp. *Rep.* ii. 149; v. 725; *Ann.* ii. 612; iv. 805 (*Mouriria*).

[7] Thw. *Hook. Kew Journ.* vi. 66, t. 1 C, *Enum. Pl. Zeyl.* 122.—B. H. *Gen.* 784, n. 28.—H. Bn. *Bull. Soc. Linn. Par.* 126.

[8] *Lythrariacearum gen. anomalum* (B. H.).

resembling those of *Mouriri*. In the species from Borneo, which we have placed in a distinct section under the name of *Naxiandra*,[1] the ovarian cells enclose each two collateral ascending ovules, inserted at the base of the internal angle, with micropyle inferior and exterior, and the valvate-induplicate petals envelop not only by their fringed margin, but also by their incurved summit, the superposed stamen, the anther of which is similar to that of the preceding genera with cells dehiscing by two longitudinal clefts. In the species from Ceylon on which the genus was founded, the petals are shorter and contorted, and each of the ovarian cells encloses only one ascending ovule. The fruit is ligneous or coriaceous, semi-superior, and the ascending seeds it contains are furnished superiorly with a vertical wing. We already know four *Axinandras*, trees of tropical Asia, with tetragonal branches, the angles of which are prolonged in false stipules at the level of the opposite leaves, and the small flowers are united at the top of the branches in more or less compound clusters.

Axinandra (Naxiandra) coriacea.

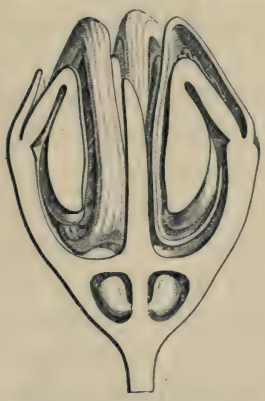

Fig. 43. Long. sect. of flower.

Memecylon laurinum.

Fig. 44. Flower (⅔).

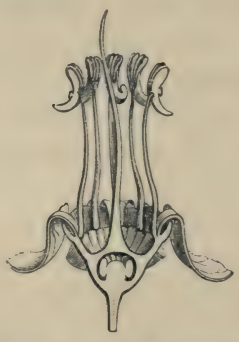

Fig. 45. Long. sect. of flower.

Memecylon[2] (fig. 44, 45), which has been raised to the rank of a tribe, and even of a sub-order and family, may be defined as *Mouriri* with the inferior ovary always one-celled, and whose tetramerous flowers have eight stamens with slender filaments exserted, and short dolabriform

[1] H. Bn. *Adansonia*, xii. 85.

[2] L. *Gen.* n. 481.—J. *Gen.* 321.—Lamk. *Ill.* t. 284.—Gærtn. *Fruct.* ii. 206, t. 127; 483, t. 179.—Desrx. *Dict.* iv. 88.—Dup.-Th. *Obs.* 57.—DC. *Prodr.* iii. 5.—Endl. *Gen.* n. 6269.—Naud. *loc. cit.* xviii. 264.—H. Bn. *Payer Fam. Nat.* 358.—B. H. *Gen.* 773, n. 134.—Tri. *Melast.* 155.—Hook. *Fl. Ind.* ii. 553.—Baker, *Fl. Maurit.* 122.—*Valikaha* Adans. *Fam. Pl.* ii. 84—*Scutula* Lour. *Fl. Cochinch.* (edit. 1790) 235.

anthers bearing a dorsal gland and a basilar and dorsal prolongation of the connective, like those of *Mouriri*. The placenta is central free, and supports from six to twelve ascending ovules, with micropyle exterior and inferior. The fruit is an umbilicate berry, the seed of which, ordinarily single, encloses an exalbuminous embryo with pointed and involute cotyledons. *Memecylon* comprises glabrous trees and shrubs from the tropical regions of the old world. The leaves are opposite, sessile or nearly so, penninerved or obscurely trinerved, entire and coriaceous. The flowers,[1] sometimes dicœcious,[2] are in simple or compound cymes, axillary in most species, axillary and terminal in that named *Spathandra*.[3] A hundred species have been described.[4]

This family was established by A. L. DE JESSIEU[5] in 1789, under the title *Melastomæ*. He included in it nine genera, placing *Acisanthera* among the *Lythrariaceæ*, and *Mouriria* and *Memecylon* among the *Onagrariariæ*. In 1818, R. BROWN[6] gave it the name of *Melastomaceæ*, and insisting on some of the characters of the plants contained in it, particularly the cavities in which the anthers are lodged in the bud, added to it *Memecylon*, following the example of DUPETIT-THOUARS,[7] and considered them as intermediate between *Myrtaceæ* and *Melastomaceæ*. In 1827, 1828, DE CANDOLLE in the "Prodromus"[8] and in a special memoir,[9] gave a description of all the *Melastomaceæ* then known, profiting by the labours bestowed upon this family by HUMBOLDT and BONPLAND,[10] by DON,[11] by SHRANK and MARTIUS,[12] and by SERINGE.[13] He distinguished sixty-eight genera, divided into two sub-orders, *Melastomeæ* and *Charianthæ*, the former comprising three tribes of *Lavoisièreæ*, *Rhexieæ* and *Miconieæ*. In 1839, ENDLICHER,[14] admitting the division of the *Melastomaceæ* into two sub-

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[1] Small, white or bluish.

[2] In *Lijndenia* (ZOLL. et MOR. *Verz.* 10).

[3] GUILLEM. et PERR. *Fl. Sen. Tent.* i. 313, t. 71.

[4] ROXB. *Pl. Corom.* t. 82.—WIGHT and ARN. *Prodr.* i. 319.—WIGHT, *Icon.* t. 276–279; *Ill.* t. 93.—MIQ. *Fl. Ind.-Bat.* i. p. i. 572.—A. GRAY, *Unit. St. Expl. Exp. Bot.* i. 573, t. 71.—THW. *Enum. Pl. Zeyl.* 110.—SEEM. *Fl. Vit.* 84.—BENTH. *Niger*, 357 (*Spathandra*).—HOOK. F. *Oliv. Fl. Trop. Afr.* ii. 441.—WALP. *Rep.* ii. 148; *Ann.* ii. 612; iii. 890; iv. 799.

[5] *Gen.* 328, Ord. 8.

[6] *Congo*, 434; *Misc. Works* (ed. BENN.) i. 116.

[7] *Obs.* 57.

[8] III. 99, Ord. 76.

[9] *Mém. Mélastom.* (Paris, 1828, 4to).

[10] *Monogr. Melastom.* (Paris, 1806–1823) I. *Melastomeæ*, 142 p. 60 t. col.; II. *Rhexiæ*, 158 p. 60 t. col.

[11] *Mem. Wern. Soc.* iv. (1823) 281.

[12] Ex DC. *loc. cit.*; *Nov. Gen. et Spec. Pl. Æquin.* iii. 160.

[13] *Mém. Mélastom.* (Genève, 1830, 4to).

[14] *Gen.* 1205, Ord. 268; *Enchirid.* 648.

orders and adding the *Memecyleæ* and *Olinieæ*, included within its limits a hundred and six genera, among others *Olinia*, which we have referred to the *Rhamnaceæ*,[1] *Myrrhinum* and *Fenzlia*, which belong to the *Myrtaceæ*.[2] From 1848 to 1852, NAUDIN[3] undertook a general revision of the *Melastomaceæ* in the herbarium of the Museum of Paris; a considerable labour equalled in patience and length of research only by that of TRIANA in 1871,[4] the results of which have been completely adopted by BENTHAM and HOOKER.[5] NAUDIN divided the family of the *Melastomaceæ* into five tribes, *Melastomeæ*, *Astronieæ*, *Kibessieæ*, *Memecyleæ* and *Mouririeæ*, and admitted a hundred and sixty-nine genera. TRIANA modified this general arrangement only by uniting the *Mouririeæ* and *Memecyleæ* on the one hand and the *Astronieæ* and *Kibessieæ* on the other, into one and the same tribe. The *Melastomaceæ* proper, which he studied with the greatest care, he grouped in eleven tribes of equal value: *Microlicieæ*, *Pleuromeæ*, *Osbeckieæ*, *Rhexieæ*, *Merianieæ*, *Oxysporeæ*, *Sonerileæ*, *Bertolonieæ*, *Dissocheteæ*, *Miconieæ*, *Pyxidantheæ*. He enumerates a hundred and thirty-four genera. BENTHAM and HOOKER on the contrary make two sub-orders of the *Astronieæ* and *Memecyleæ*, and divide the *Melastomeæ* into nine tribes only; the whole comprising eighteen hundred species.

GEOGRAPHICAL DISTRIBUTION.—They are plants of warm countries, rare in the sub-tropical regions. In North America they terminate in the south of Mexico, and in the southern hemisphere, in America as in Australia and at the Cape, they rarely pass beyond the 30th degree of latitude. They do not exist in Europe, and are not found beyond the warm parts of China. All the *Astronieæ* are from Asia and tropical Oceania; the *Mouriri* from tropical America, and *Memecylon* from the tropical regions of the old world. To America exclusively belong the secondary groups of *Melastomeæ* which BENTHAM and HOOKER name *Blakeeæ*, *Miconieæ*, *Merianieæ*, *Rhexieæ*, and *Microlicieæ*. Their *Oxysporeæ* and *Medinilleæ* are from the old world, and the remaining groups belong alike to America, Asia, and tropical Africa.

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[1] *Bull. Soc. Linn. Par.* 90.

[2] See vol. vi. 354, 356.

[3] *Ann. Sc. Nat.* ser. 3, xii–xviii.

[4] *Trans. Linn. Soc.* xxviii. Our first attempt at classification, says TRIANA, comprising the delimitation and synonymy of the genera, was expounded before the Botanical Congress of Amsterdam in 1865, and communicated to Dr. HOOKER the same year.

[5] *Gen.* 725, Ord. 68.

As seen, we adopt the division of the *Melastomaceæ* into *Melastomeæ*, *Astronieæ* and *Blakeeæ*, which three series are thus characterized:

I. MELASTOMEÆ.[1]—Flowers with free ovary or more or less "adherent" in the lower part, divided into 2–∞ multiovulate cells. Placentas thick, prominent, inserted in the internal angle of the cells and at mid height. Fruit polyspermous, capsular or indehiscent and more or less fleshy. Seeds small, straight or curved, with very small fleshy embryo rounded or nearly globular and equal or unequal cotyledons. Trees and rarely herbs of both worlds.—46 genera.

We divide this series into ten sub-series:

a. *Eumelastomeæ* (*Osbeckieæ*).—Fruit capsular or fleshy. Hairs often starred. Seeds curved or cochleate. Stamens with connective most frequently prolonged below the anther, often with anterior prominences. (Old world.)

b. *Tibouchineæ* (*Pleromeæ*).—Fruit capsular, free or nearly so. Seeds. Hairs rarely starred. Stamens of *Eumelastomeæ*. (New world.)

c. *Microlicieæ*.—Fruit capsular. Seeds ovoid or oblong. Stamens of *Eumelastomeæ*. (New world.)

d. *Bertolonieæ* (*Sonerileæ*).—Ovary 3–5-celled. Fruit capsular, depressed at summit. Seeds straight or slightly curved. Stamens with connective bare or furnished with anterior prominences, or with anterior and posterior. (Both worlds.)

e. *Rousseauxieæ*.—Ovary 4-celled, half free. Fruit capsular. Stamens (8) with connective not prolonged and without appendages. Seeds straight (?). Anthers not undulated. (Old world.)

f. *Oxysporeæ*.—Ovary with cells equal in number to that of petals. Fruit capsular. Stamens with connective pointed or spurred outwardly, generally without anterior appendage. Seeds straight, oblong or angular, with raphe often prominent. (Old world.)

g. *Medinilleæ* (*Dissocheteæ*).—Fruit fleshy or coriaceous, indehiscent or breaking irregularly. Seeds straight or slightly curved, with raphe often prominent. Anthers often recurved, without prominence or with dorsal or ventral prominences. (Old world.)

h. *Rhexieæ*.—Fruit dry. Seeds cochleate. Stamens but slightly unequal, or very dissimilar, the largest oppositipetalous. Connective with dorsal appendage. (New world.)

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[1] *Melastomeæ* SER. *l.c. cit.*—B. H. *Gen.* 726, Subord. (I part).—*Charianthæ* SER. (part).

i. *Miconieæ*.—Fruit coriaceous, generally indehiscent. Seeds ovoid or pyramidal, rarely curved. Stamens nearly equal, with variable anterior, rarely exterior appendages. (New world.)

j. *Merianeæ*.—Fruit capsular. Seeds straight, elongate or cuneiform, sometimes winged. Stamens with connective bare, little or not at all prolonged below the cells, sometimes furnished with a thick dorsal appendage. (New world.)

II. Astronieæ.[1]—Flowers with inferior ("adherent") 2–∞ -celled ovary. Placenta multiovulate, inserted in internal angle or near the base, often elongate, ascending, or rising more or less on the dorsal coat of the cells. Stamens with short anthers, ordinarily with a short and thick dorsal basilar spur. Fruit fleshy or coriaceous. Seeds short, straight, often obcuneiform.—3 genera.

III. Blakeeæ.[2]—Flowers with inferior ("adherent") ovary, sometimes with 2–4 bracts forming an involucre. Ovarian cells 1–∞, multiovulate or with ovules definite in number (1–12), ascending, with micropyle exterior and inferior. Anthers with short thick dorsal basilar spur, dehiscing by elongate or short (poriform) clefts. Seeds with fleshy embryo, plano-convex or subfoliaceous cotyledons. Leaves penninerved or 3–5-plinerved, with secondary nervures often but faintly visible.—5 genera.

Thus constituted, this family approaches the *Myrtaceæ* by the *Blakeeæ* and *Astronieæ*, the *Lythrariaceæ* by the genera with free ovary, or by those which, as *Fœtidia* and *Sonneratia*, have the ovary partly or wholly adherent. The *Melastomaceæ* are not odorous and punctuated like the *Myrtaceæ*, from which they differ, as from the *Lythrariaceæ*, by the nervation of their leaves and the peculiar organization of their stamens. The *Onagrariaceæ* are neighbours of the *Melastomaceæ* by reason of their close analogies with the *Lythrariaceæ* and *Myrtaceæ*.

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[1] *Astronieæ* Naud.—Tri. *Melastom.* 151, Trib. 12.—B. H. *Gen.* 727, Subord. II.

[2] B. H. *Gen.* 727, Trib. (*Melastomearum*) 9.—*Pyxidantheæ* Tri. *Melast.* 148, Trib. 11.—*Memecyleæ* DC. *Prodr.* iii. 5, Ord. 67.—Endl. *Gen.* 1222.—*Memecylaceæ* Lindl. *Veg. Kingd.* 731.—*Mouririaceæ* Gardn. *Hook. Journ.* ii. 23.

PROPERTIES.[1]—These are imperfectly determined, and but few plants of this family are used. Not aromatics and stimulants like the *Myrtaceæ*, or evacuants like some *Lythrariaceæ*, a considerable number of the *Melastomaceæ* are slightly astringent. The leaves of *Astronia* are often acid; those of *A. papetaria*[2] are used in Malaya for preparing fish sauce. The solid wood is used for building; its bark is astringent. The wood of *Kibessia azurea*[3] is equally useful. The bark of *Medinilla* is emollient; cataplasms are prepared from it, as also from that of *Osbeckia chinensis*.[4] *M. macrocarpa*[5] of the Moluccas is reputed alexipharmic. The fruit of *M. javanensis*[6] (fig. 21) is edible. *M. crispata* is employed in the treatment of tumours, wounds and snake-bites. Its acid leaves are also esteemed as a condiment. *Melastoma malabathricum*[7] (fig. 1–7) is recommended as an astringent in flux, diarrhœa, and dysentery. Its bark is used in lotions and gargles. The berries are edible[8] and form a red dye for wool. The roots of *M. Polyanthum*,[9] a species closely allied to the preceding, is prescribed against epilepsy in the Moluccas. *M. septemnervia*,[10] in Cochin China, is used in the treatment of diarrhœtic affections.[11] The fruit of *Osbeckia Wightiana*[12] is employed in dyeing by the Indians. Its leaves are prescribed against stomatitis and enteritis. The wood furnishes charcoal for powder, and the flowers form ornaments for the head. *O. octandra*[13] is also astringent;

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[1] ENDL. *Enchirid.* 648.—LINDL. *Veg. Kingd.* 733.—ROSENTH. *Synops. Pl. Diaphor.* 914, 1158.

[2] BL. *Flora* (1831) 526.—*A. spectabilis* ZIPP. —*Pharnaceum papetarium* RUMPH. *Herb. Amboin.* iv. 134, t. 69.

[3] DC. *Prodr.* iii. 196.—BL. *Mus. Lugd.-Bat.* i. 8.—*M. azurea* BL. *Bijdr.* 1079.—*M. echinata* REINW.

[4] L. *Spec.* 490.—*O. angustifolia* DON, *Prodr. Fl. Nepal.* 221.—*O. japonica* NAUD.—*O. zeylanica* DC. (not L.).—*O. linearis* BL.—*O. myrtifolia* BL.—*O. decora* WALL.—*Tristemma angustifolium* BL. *Bijdr.* 1079.

[5] BL. *Flora* (1831) 510; *Rumphia* i. t. 2.—*M. nodosum* ZIPP.

[6] BL. *Flora* (1831) 515.—HOOK. *Bot. Mag.* t. 4569.—*M. javanense* BL. *Bijdr.* 1078.—*M. epidendra* REINW.

[7] L. *Spec.* 559.—*M. quinquenervium* BURM. *Thes. Zeyl.* t. 73.—*M. affine* DON.—*M. denticulatum* LABILL. *Sert. Austro.-Caled.* t. 64.—*M. polyanthum* BL.—*M. articulatum* NAUD.—*M. heterostegium* NAUD.—*M. Novæ-Hollandiæ* NAUD. —*M. anolanthum* NAUD.—*M. Seychellarum* NAUD.

[8] It is asserted that the name of the genus *Melastoma* originated in the blackened lips caused by eating its fruit.

[9] BL. *Flora* (1831) 481.—*M. malabathricum* JACK (not L.).—*M. tonadense* BL.—*M. brachyodon* NAUD.—*M. oliganthum* NAUD.—*M. Hombronianum* NAUD.

[10] LOUR. *Fl. Coch.* (ed. 1790) 273 (*Cây mua*).

[11] *M. cyanoides* (*M. moluccanum* BL. *Bijdr.* 1078;—*M. cyanoides* SM. *Rees Cyclop.* t. 23;—*Otanthera moluccana* BL.;—*O. cyanoides* TRI.) also has edible fruit. The women of the Moluccas consider its roots an energetic abortive. The berries are given to children afflicted with incontinence of urine.

[12] BENTH. *Cat. Wall.* n. 4060.—WIGHT, *Icon.* t. 998.—*O. Kotigueda* NAUD.

[13] DC. *Prodr.* iii. 143.—*O. virgata* DON.—*O. chinensis Bot. Mag.* t. 4026.—*O. polycephala* NAUD. — *M. osbeckioides* HOOK. *Bot. Mag.* t. 2235.

its bark, leaves, flowers and fruit, mixed with oil of Sesame, are employed in the treatment of aphtha and angina. *O. chinensis*[1] is emollient; its leaves are used in cataplasms. The fruit of *O. aspera*[2] is edible; in Java an infusion from its leaves is considered salutary in the treatment of angina. *O. virusana*[3] is reputed antisyphilitic in Mauritius. The fruit of *Blakea* is edible and in most cases dyes red; *B. parasitica*[4] and *guianensis* (fig. 39) are particularly mentioned. The fruit of *Bellucia*, for example *B. brasiliensis*,[5] *arborescens*,[6] *Hostmanni*[7] and *grossularioides*[8] (fig. 40), has the same uses. An infusion of *Tibouchina aspera*[9] is taken, in Guyana, against angina and bronchitis. The bark of *T. Maximiliana*,[10] in Brazil, yields a black dye. *T. holosericea*[11] and *Langsdorffiana*,[12] from the same country, are said to dye black or violet, and are prescribed in infusion against angina. *Brachyotum canescens*[13] is considered, in the Andes, salutary in diseases of the urinary organs, and even in stone. In Jamaica, the aromatic flowers of *Meriana leucantha* Sw., *purpurea* Sw., and *rosea* Tuss. are employed as pectorals. All the parts, but especially the buds, balsamic and anticatarrhal, of *Microlicia grandiflora*,[14] from Guyana and Brazil, are prescribed in pulmonary affections. *Henriettea*, particularly *H. flavescens*,[15] *H. Kappleriana* Steud. and *H.*

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[1] L. *Spec.* 490 (not *Bot. Mag.* t. 4026).—*O. angustifolia* Don.—*O. decora* Wall.—*O. glabrata* Wall.—*O. linearis* Bl.—*O. myrtifolia* Bl.—*Tristemma angustifolium* Bl. *Bijdr.* 1079.

[2] Bl. *Flora* (1831), ii. 474.—Wight, *Icon.* 377.—*M. aspera* L. *Fl. Zeyl.* 76.—*Asterostoma asperum* Bl.

[3] *M. virusanum* Don, *Mem. Wern. Soc.* iv. 290.—*Tristemma virusanum* Commers. *J. Gen.* 329.—DC. *Prodr.* iii. 144.—*T. mauritiana* Poir. *Dict.* viii. 956.

[4] Don, *Mem. Wern. Soc.* iv. 327.—*Topobea parasitica* Aubl. *Guian.* i. 467, t. 189.

[5] Naud. *Ann. Sc. Nat.* ser. 3, xvi. 104.

[6] *M. arborescens* Aubl. *Guian.* 420, t. 163.—*Loreya arborescens* DC. *Prodr.* iii. 179.—Naud. *loc. cit.* xviii. 109.

[7] Naud. *loc. cit.* xvi. 103.

[8] Tri. *Melast.* 141.—*B. Aubletii* Naud.—*B. multiflora* Karst.—*M. grossularioides* L. *Spec.* 558.—*Blakea quinquenervia* Aubl. *Guian.* 595, t. 210.—*Apatilia blakeoides* Desvx. *Ham. Prodr.* 42.—*Ischyranthera lævigata* Steud. (*Coronillo*, of Panama.)

[9] Aubl. *Guian.* 446, t. 177.—DC. *Prodr.* iii. 144.—*M. aromatica* Vahl. *Ecl.* i. 41.—*T. Tibouchina* Desrx. *Lamk. Dict.* iv. 49.—Don, *Mem. Wern. Soc.* iv. 288.—*Rhexia aspera* W. *Spec.* ii. 304.—*Lasiandra Tibouchina* Naud. *Ann. Sc. Nat.* ser. 3, xiii. 153.—*Pleroma Tibouchinum* Tri. *Melast.* 45.

[10] *Lasiandra Maximiliana* DC. *Prodr.* iii. 128.—*Pleroma Maximilianum* Tri. *Melast.* 43.

[11] *M. holosericea* Sw. *Obs.* 176.—*M. argentea* Desrx.—*M. clavata* Pers.—*Rhexia holosericea* B. *Rhex.* t. 12.—*Lasiandra protecæformis* DC.—*L. argentea* DC.—*Pleroma holosericeum* Don.—*P. argenteum* A. Gray.

[12] *Rhexia Langsdorffiana* B. *Rhex.* t. 51.—*Osbeckia Langsdorffiana* Spreng. *Syst.* ii. 312.—*Lasiandra Langsdorffiana* DC.—*L. Gardnerii* Naud.—*Pleroma Langsdorffianum* Tri.

[13] Tri. *Melast.* 48.—*Rhexia canescens* B.—*Chætogastra canescens* DC.

[14] *Lavoisiera grandiflora* Naud. *Ann. Sc. Nat.* ser. 3, ii. 148; xii. 217.

[15] *M. flavescens* Aubl. *Guian.* 423, t. 164.—*Ossæa flavescens* DC. *Prodr.* iii. 169.—*Loreya flavescens* Naud. *loc. cit.* xviii. 110.—*Henriettella flavescens* Tri.

succosa,[1] species from Cayenne, often bear edible fruit. The bark of the last is used in the treatment of abscesses and wounds. Many species of *Miconia* are used: the fruit of *M. cinnamomifolia*,[2] from the Antilles, yields a yellow dye; that of *M. agrestis*,[3] from Peru and Guyana, is considered antibilious; that of *M. macrophylla*,[4] from equinoctial America, is edible; the juice of *M. Fothergilla* [5] is applied to punctures to relieve pain; the down of *M. stenostachya*,[6] from tropical America, is employed as a hæmostatic; a decoction from *M. alata*,[7] in Guyana, forms a detergent for obstinate ulcers; *M. prasina*,[8] in Cayenne, and *M. longifolia* DC. yield a black dye; *M. tinctoria* MART. dyes yellow, and its fruit is edible; *M. reclinata* NAUD. and *M. media* TRI. also furnish a yellow dye; from *M. milleflora*,[9] in equinoctial America, aromatic and digestive infusions are prepared. The genus *Maieta*, as limited by us, also contains some useful species: the fruit of *M. guianensis*,[10] as also of *M. Pœppigii* and *heterophylla* DC. is eaten; the berries of *M. hirta* [11] are acidulous and considered antibilious; *M. dependens* [12] also supplies edible fruit; in the Antilles infusions from the fruit of *M. angustifolia* [13] are used in case of swellings, stomatitis, angina, &c.; the fruit of *M. rubra* [14] is eaten. In Java and Sumatra, refreshing drinks are prepared from the berries of *Marumia muscosa* [15] (fig. 25) and *stellulata*.[16] In Panama *Miconia speciosa* [17] is used to clean plate, &c.; it is vulgarly called *Friego-plato*.

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[1] DC. *Prodr.* iii. 178.—*H. brasiliensis* CASAR. —*M. succosa* AUBL. *Guian.* 418, t. 162.—*M. brunneum* VAHL.

[2] TRI. *Melast.* 101 (not NAUD.).—*M. cinnamomifolia* JACQ. *Coll.* ii. t. 6.

[3] *M. agresta* AUBL. *Guian.* 425, t. 166.—*Clidemia agrestis* DON.—*C. depauperata* DC.—*Oxymeris agrestis* TRI.

[4] TRI. *Melast.* 103.—*M. platyhedra* NAUD.—*Chitonia macrophylla* DON.

[5] NAUD. *Ann. Sc. Nat.* ser. 3, xvi. 119.—*M. Fothergilla* B. *Melast.* t. 32.

[6] DC. *Prodr.* iii. 181.—*M. argyrophylla* NAUD. *loc. cit.* xvi. 147 (not DC.).

[7] DC. *Prodr.* iii. 184.—*M. alata* AUBL. *Guian.* 410, t. 158.

[8] DC. *Prodr.* iii. 188.—*M. prasina* SW. *Fl. Ind. Occ.* 777.—*M. parviflora* AUBL. *Guian.* 433, t. 171.

[9] NAUD. *Ann. Sc. Nat.* ser. 3, xvi. 237.—*M. dimorpha* NAUD.—*M. hartigioides* NAUD.—*M. theæzans* DC. *Prodr.* iii. 194.—*Cremanium milleflorum* DC.—*C. glaberrimum* DC.—*C. minutiflorum* DC.—*C. rubens* GRISEB.—*C. ambiguum* BENTH. *Pl. Hartweg.* 181.

[10] AUBL. *Guian.* 443, t. 176.—*M. dispar* MIQ. —*M. hypophysca* DC.—*M. Maieta* DESRX. *Dict.* iv. 34.—*Toeoca Maieta* DON.

[11] *Clidemia hirta* DON. *Mem. Wern. Soc.* iv. 309.—*C. elegans* DON.—*C. crenata* DC.—*M. elegans* AUBL. *Guian.* 427, t. 167.—*Staphidium pauciflorum* NAUD.

[12] *Clidemia dependens* DON, *Mem. Wern. Soc.* iv. 307.

[13] *M. hirta* DESRX. *Lamk. Dict.* iv. 42 (not L.).—*Heterotrichum angustifolium* DC. *Prodr.* iii. 173 (*Groseillier épineux des Antilles*).

[14] *M. rubra* AUBL. *Guian.* 416, t. 161.—*Sagræa rubra* TRI. *Melast.* 137.

[15] BL. *Flora* (1831), 204; *Rumphia*, i. t. 4.

[16] BL. *Flora* (1831), 585.—*M. vulcanica* KORTH.—*M. Jackii* KORTH.—*M. stellula* JACK, *Trans. Linn. Soc.* xiv. 6.

[17] *Conostegia speciosa* NAUD.—SEEM. *Voy. Herald. Bot.* 121.

In the same country the wood of *M. longistyla* Steud., *Cainillo* of the natives, is used for building.

Mouriri rhizophoræfolia,[1] a shrub of the Antilles, has fetid flowers, a nauseous fruit, but seeds with a filbert flavour. *M. guianensis* is considered astringent in its native country. Several species of *Memecylon* are useful: the leaves of *M. capitellatum*,[2] are used in Ceylon to dye cotton yellow and red; *M. grande*,[3] in the same country, takes nearly the place of saffron; the bark of *M. intermedium*[4] yields a black dye in Java; *M. edule*,[5] *grandifolium* Naud., *sphærocarpum* DC., etc., in India and in Madagascar, furnish edible fruits. Many ornamental *Melastomaceæ* are cultivated in our conservatories, especially *Melastoma*, *Centradenia*, *Gravesia*, *Clidemia*, *Monochætum*, *Miconia*, *Tibouchina*, *Medinilla*, *Sonerila* and *Bertolonia*. The flowers are sometimes large and handsome, but these plants are much more generally esteemed for their leaves, green or purple or feathery, punctuate, sometimes of a metallic lustre.

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[1] *Mouriria rhizophoræfolia* Tri. *Melast.* 153. —*Olisbea rhizophoræfolia* DC. *Prodr.* iii. 31.—*Guildingia psidioides* Hook. *Bot. Misc.* i. 122, t. 30.

[2] L. *Spec.* 497; *Fl. Zeyl.* 136.—Burm. *Pl. Zeyl.* t. 30; *Fl. Ind.* 87.—Lamk. *Ill.* t. 284, fig. 1.—DC. *Prodr.* iii. 6.—Miq. *Fl. Ind.-Bat.* i. 574. —Thw. *Enum. Pl. Zeyl.* 110.—Bl. *Mus. Lugd.-Bat.* i. 254 (part).—Rosenth. *op. cit.* 919.

[3] Retz. *Obs.* iv. 26.

[4] Bl. *Mus. Lugd.-Bat.* i. 358.—*M. umbellatum* Bl. (not Burm.).—*M. garcinioides* β *elongatum* Bl.

[5] Roxb. *Pl. Corom.* i. 82.—DC. *Prodr.* iii. 6. —Tri. *Melast.* 158, n. 63.—Thw. *Enum. Pl. Zeyl.* 110.—*M. ovatum* Sm. *Rees Cyclop.*—DC. *Prodr.* iii. 6.—*M. lucidum* Presl *Epim.* 209.—*M. tinctorium* β Wight and Arn. *Prodr.* 319.—*M. grande* Wall. *Cat.* n. 4103 (not Bl.).—*M. ramiflorum* Ham. *Cat. Wall.* n. 4103.—*M. prasinum* Naud. *loc. cit.* xviii. 275.—? *M. pinifolium* Naud. *loc. cit.* (ex Tri.).

GENERA.

I. MELASTOMEÆ.

1. **Melastoma** Burm.—Flowers hermaphrodite regular, oftener 5-merous, more rarely 6, 7-merous; receptacle sacciform, externally setose, strigose, paleaceo- or penicellato-strigose. Sepals 5–7, inserted at margin of receptacle, equal to or shorter than receptacle, sometimes alternating with an equal number of setiform teeth; contorted in prefloration. Petals same in number alternate, inserted with sepals, obovate or unequilateral, contorted contrariwise to the sepals. Stamens twice as many as the petals, 2-seriate, the 5–7 alternipetalous being larger; filaments inserted with perianth; anthers oblong- or linear-subulate, incurved in bud, often finally recurved, introrse, 1-porous at apex; connective more or less produced below cells and there at base 2-tuberculate or 2-calcarate within; but the oppositipetalous smaller; connective not or very slightly produced, 2-tuberculate. Germen inserted at bottom of receptacle, sometimes free for the greater part or internally united to the receptacle by means of the septa alternating with the stamens and enclosing the top of the anther in the bud; style slender, at base girt to greater or less height by the produced summit of the germen, at stigmatose apex obtuse or dilated. Ovules in 5–7 cells indefinite in number, inserted in axil of thick placenta, small, anatropous. Fruit baccate, fleshy or subcoriaceous, girt with setose, pulpy, or coriaceous receptacle, indehiscent or opening unequally. Seeds ∞, small, cochleate or arcuate; cotyledons of exalbuminous or fleshy embryo equal or unequal; the exterior sometimes larger.—Shrubs, oftener strigose, erect or more rarely creeping; leaves opposite coriaceous entire, 5–7-nerved; flowers terminal solitary, 2-bracteate or in cymes or short cymiferous-compound racemes. (*Trop. Asia and Oceania, Seychelles.*)—See p. 1.

2. **Osbeckia** L.[1]—Flowers nearly of *Melastoma*, 4, 5-merous or very rarely 6, 7-merous. Stamens 8–14, 2-seriate, either very slightly unequal, or the oppositipetalous a little shorter (*Dissotis*,[2] *Tristemma*[3]); the connective of all or of the longer more or less produced under the anthers, or very slightly (*Nerophila*),[4] internally at the base 2-tuberculate (*Euosbeckia*,[5] *Antherotoma*,[6] *Tristemma*) or appendiculate (*Dissotis*), sometimes destitute of tubercles (*Guyonia*[7]); cells acute at apex, poricidal, or more widely truncate; pore larger oblique (*Antherotoma*). Fruit capsular, oftener setose at vertex, 4, 5-valvate; seeds, &c. of *Melastoma*.—Shrubs or herbs, sometimes annual (*Nerophila*); habit various; leaves of *Melastoma*; flowers terminal, or more rarely axilar (*Guyonia*), solitary or cymose or glomerate, sometimes (*Antherotoma*, *Nerophila*, *Tristemma*) more or less fully involucrate with bracts.[8] (*Trop. Asia and Africa cont. and ins.*[9])

3. **Dichætanthera** Endl.[10]—Flowers nearly of *Melastoma*, 4, 5-merous; sepals broad concave, much contorted or imbricate. Petals 4, 5, retuse. Stamens 8–10, nearly of *Melastoma*, connective of the larger longer produced and longer appendiculate; aristæ 2, slender, long subulate. Fruit capsular, 4, 5-valved at apex; seeds nearly straight or more or less cochleate.—Shrubs; branches nodose; leaves petiolate, 3-nerved; flowers in terminal 2-chotomous cymes; bracts concave.[11]—(*Madagascar*.[12])

[1] *Gen.* n. 467.—J. *Gen.* 330.—DC. *Prodr.* iii. 138.—Endl. *Gen.* n. 6221 (part).—Naud. *Ann. Sc. Nat.* ser. 3, xiv. 53.—B. H. *Gen.* 744, n. 38.—Tri. *Melast.* 53, t. 4, fig. 37.—Hook. *Fl. Ind.* ii. 513.—*Asterotoma* Bl. *Mus. Lugd.-Bat.* i. 50.—*Amblyanthera* Bl.—*Ceramicalyx* Bl. *loc. cit.*

[2] Benth. *Niger*, 346.—B. H. *Gen.* 746, n. 46.—Tri. *Melast.* 57, t. 4, fig. 44.—*Osbeckiastrum* Naud. *Ann. Sc. Nat.* ser. 3, xiii. t. 7; xiv. 18.—*Argyrella* Naud. *loc. cit.* xiii. 300.—*Heterotis* Benth. *Niger*, 347.—*Melastomastrum* Naud. *loc. cit.* xiii. 296, t. 5.—*Lepidanthemum* Kl. *Pet. Moss. Bot.* 64.

[3] J. *Gen.* 329.—Endl. *Gen.* n. 6216.—Naud. *Ann. Sc. Nat.* ser. 3, xiii. 297, t. 5, 6.—Tri. *Melast.* 56, t. 4, fig. 41.—Baker, *Fl. Maurit.* 121.

[4] Naud. *Ann. Sc. Nat.* ser. 3, xiii. f. 8; xiv. 119.—B. H. *Gen.* 744, n. 37.—Tri. *Melast.* 55, t. 4, fig. 38.

[5] *Osbeckia* Tri. *loc. cit.*

[6] Hook. f. *Gen.* 745, n. 40.

[7] Naud. *Ann. Sc. Nat.* ser. 3, xiv. 149, t. 6.—B. H. *Gen.* 745, n. 39.—Tri. *Melast.* 55, t. 4, fig. 39.

[8] A genus scarcely legitimate; differing from *Melastoma* only in the nature of its pericarp.

[9] Wall. *Pl. As. Rar.* t. 240, 251.—Wight, *Icon.* t. 375–377, 996–998, 1612.—Mig. *Fl. Ind.-Bat.* i. p. i. 517.—Vent. *Ch. de Pl.* t. 35 (*Tristemma*).—P.-Beauv. *Fl. Ow.* t. 57 (*Tristemma*).—Benth. *Niger*, 353 (*Tristemma*); *Fl. Austral.* iii. 290.—Hook. f. *Oliv. Fl. Trop. Afr.* ii. 441, 443 (*Guyonia*), 445 (*Tristemma*), 447 (*Dissotis*).—Thw. *Enum. Pl. Zeyl.* 104.—Harv. and Sond. *Fl. Cap.* ii. 518.—*Bot. Mag.* t 2838, 3790, 4026, 5085.—*Bot. Reg.* t. 542, 565, 674, 1475.—Walp. *Rep.* ii. 135, 918; v. 708; *Ann.* ii. 574; iv. 808.

[10] *Gen.* n. 6227.—Naud. *Ann. Sc. Nat.* ser. 3, xiv. t. 7; xv. 49.—Tri. *Melast.* 61, t. 4, fig. 46.—B. H. *Gen.* 747, n. 47.

[11] Perhaps a section of this genus is *Dionychia Bojerii* (Naud. *loc. cit.* xiv. t. 17; xv. 48.—Tri. *Melast.* 61, t. 4, fig. 47.—B. H. *Gen.* 745, n. 42), imperfectly known, whose 3 stamens present a connective hardly produced; shorter appendages; the top of the filament (quite as in *Dichætantheris*) inflexed in the bud.

[12] Spec. 3, 4. Desrx. *Lamk. Dict.* iv. 56 (*Melastoma*).—Don, *Mem. Wern. Soc.* iv. 290 (*Melastoma*).—DC. *Prodr.* iii. 153, n. 2 (*Rousseauxia*).

4 ? **Dinophora** Benth.[1]—Flowers nearly of *Osbeckia;* receptacle very glabrous; calyx membranous shortly sinuate. Petals 5. Stamens 10; anthers linear subulate, 1-porous at apex, connective at base shortly produced dilated and anteriorly emarginate. Gynæcium of *Melastoma*, 5-merous. Fruit capsular, opening unequally; seeds cochleate. Other characters of *Osbeckia*.—"A subglabrous shrublet; branches herbaceous, 4-gonal; leaves at base cordate, ovato-lanceolate, ciliato-serrulate; flowers in terminal compound divaricate racemes; pedicels long and slender." [2] (*Trop. West Africa.*[3])

5. **Tibouchina** Aubl.[4]—Flowers (nearly of *Melastoma* or *Osbeckia*) 4, 5-merous; receptacle glabrous or variously clothed. Petals 4, 5, contorted. Stamens 8–10, rarely subequal (*Marcetia*,[5] *Chætolepis*[6]), generally somewhat (*Purpurella*,[7] *Macairea*,[8] *Fritzschia*,[9] *Comolia*,[10] *Pterolepis*[11]), oftener very unequal (*Heeria*,[12] *Arthrostemma*,[13] *Nepsera*,[14] *Ernestia*,[15] *Microlepis*,[16] *Desmoceles*,[17] *Appendicularia*,[18] ?*Acisanthera*[19]);

[1] *Niger*, 355.—B. H. *Gen.* 745, n. 41.

[2] A genus unknown to us, "very like *Nepsera* and *Ernestia* in habit" (B. H.).

[3] Spec. 1. *D. spenneroides* Benth.—Tri. *Melast.* 56, t. 4, fig. 42.

[4] Aubl. *Guian.* i. 446, t. 177 (1775).—DC. *Prodr.* iii. 143.—Endl. *Gen.* n. 6214.—H. Bn. *Adansonia*, xii. 70, 95.—*Savastania* Neck. *Elem.* n. 795 (1790).—*Pleroma* Don, *Mem. Wern. Soc.* iv. 293 (1823).—DC. *Prodr.* iii. 151.—Endl. *Gen.* n. 6217.—B. H. *Gen.* 743, n. 31.—Tri. *Melast.* 40, t. 3, fig. 31.—*Lasiandra* DC. *Prodr.* iii. 127; *Mém. Mélast.* 42, t. 7.—Endl. *Gen.* n. 6208.—Naud. *Ann. Sc. Nat.* ser. 3, xiii. 126.—*Diplostegium* Don, *Mem. Wern. Soc.* iv. 296.—*Hephestionia* Naud. *loc. cit.* xiii. 36.—*Oreocosmus* Naud. *loc. cit.* xii. t. 14; xiii. 37.—*Micranthella* Naud. *op. cit.* xiii. 347.

[5] DC. *Prodr.* iii. 124.—Endl. *Gen.* n. 6205.—B. H. *Gen.* 744, n. 34.—Tri. *Melast.* 50, t. 3, fig. 34.

[6] DC. *Prodr.* iii. 140 (sect. of *Osbeckia*).—Miq. *Comm. Phyt.* ii. 72.—B. H. *Gen.* 744, n. 55.—Tri. *Melast.* 50, t. 3, fig. 35.—*Haplodesmium* Naud. *Ann. Sc. Nat.* ser. iii. xiv. 150, t. 5.—*Trimeranthus* Karst. *Fl. Columb.* i. 193, t. 96 (accessory teeth of calyx 0).

[7] Naud. *loc. cit.* xiii. 301.—B. H. *Gen.* 742, n. 30.—Tri. *Melast.* 35, t. 2, fig. 22.

[8] DC. *Prodr.* iii. 109; *Mém. Mélast.* t. 6.—Endl. *Gen.* n. 6209.—B. H. *Gen.* 742, n. 28.—Tri. *Melast.* 37, t. 2, fig. 28.

[9] Cham. *Linnæa*, ix. 397.—Endl. *Gen.* n. 6198.—B. H. *Gen.* 743, n. 32.—Tri. *Melast.* 48, t. 3, fig. 32 (habit of *Serpyllum*).

[10] DC. *Prodr.* iii. 114.—Naud. *loc. cit.* xiii. 25.—B. H. *Gen.* 741, n. 26.—Tri. *Melast.* 36, t. 2, fig. 27 (cochleate seed of *Tibouchina*, rough or foveolate).—*Tricentrum* DC. *Prodr.* iii. 123 (ex. B. H.).

[11] DC. *Prodr.* iii. 140 (sect. of *Osbeckia*).—Miq. *Comm. Phyt.* ii. 72.—B. H. *Gen.* 742, n. 27.—Tri. *Melast.* 38, t. 2, fig. 29.—*Brachyandra* Naud. *l. c.* ii. 143; xiii. 355.—*Arthrostemma* Naud. *loc. cit.* xiii. 355, t. 6 (not R. et Pav.).

[12] Schlchtl, *Linnæa*, xiii. 432.—Endl. *Gen.* n. 6212.—B. H. *Gen.* 740.—Tri. *Melast.* 34, t. 2, fig. 20.—*Heterocentron* Hook. and Arn. *Beech. Voy. Bot.* 290 (not Naud.).—*Schizocentron* Meissn. *Gen. Comm.* 355.

[13] R. et Pav. *Fl. Per.* iv. t. 326 (1798).—Don, *Mem. Wern. Soc.* iv. 292.—DC. *Prodr.* iii. 135 (part).—Endl. *Gen.* n. 6211 (part).—B. H. *Gen.* 740, n. 21.—Tri. *Melast.* 35, t. 2, fig. 21.—*Heteronoma* DC. *Prodr.* iii. 122 (stem herbaceous or shrubby, 2-chotomous).

[14] Naud. *Ann. Sc. Nat.* ser. 3, xii. t. 14; xiii. 28.—B. H. *Gen.* 741, n. 25.—Tri. *Melast.* 36, t. 2, fig. 26.

[15] DC. *Prodr.* iii. 121.—Endl. *Gen.* n. 6199.—Naud. *loc. cit.* xii. t. 14; xiii. 30.—B. H. *Gen.* 740, n. 22.—Tri. *Melast.* 35, t. 2, fig. 23.—*Dichætandra* Naud. *loc. cit.* xii. t. 14; xiii. 31.

[16] Miq. *Linnæa*, xxii. 541.—B. H. *Gen.* 741, n. 24.—Tri. *Melast.* 36, t. 2, fig. 25.

[17] Naud. *Ann. Sc. Nat.* ser. 3, xii. t. 14; xiii. 29.—B. H. *Gen.* 740, n. 19.—Tri. *Melast.* 34, t. 2, fig. 19.

[18] DC. *Prodr.* iii. 114.—Naud. *Ann. Sc. Nat.* ser. 3, xii. t. 14; xiii. 32.—B. H. *Gen.* 741, n. 23.—Tri. *Melast.* 36, t. 2, fig. 24.

[19] P. Br. *Hist. Jam.* 217, t. 22, fig. 1 (1756).

anthers inflexed in bud, 1-porous at apex, pore small or larger, connective below cells more or less (sometimes very little) anteriorly elongate, curved, and furnished at base with 2 appendages very various in form and size. Germen quite or to a large extent free, glabrous or variously clothed, conical or hemispherical at apex. Fruit capsular, 2–5-celled; seeds ∞, oftener punctulate, or oftener curved or cochleate, or straight, oblong or ovoid (*Bucquetia*,[1] *Pyramia*,[2] *Comolia*, *Svitramia*,[3] *Meissneria*,[4] *Tulasnea*[5]), sometimes curved or subcochleate (*Poteranthera*[6]).—Shrubs, undershrubs or herbs; leaves opposite, rarely verticillate, entire or serrate or dentate, 3–7-nerved; flowers solitary or oftener in simple or compound cymiferous racemes.[7] (*Both trop. Americas.*[8])

6 ? **Pterogastra** Naud.[9]—Flowers nearly of *Tibouchina*, 4, 5-merous; receptacle externally furnished with vertical echinate ribs. Stamens 8–10, unequal; anthers subulate, connective of the greater (alternipetalous) longer produced, furnished with a short (or 0) appendage. Germen free, 4, 5-celled, setose at vertex; style slender, slightly or not dilated at apex. Capsule 4, 5-valved; seeds curved or cochleate roughish.—Annual herbs, 2-chotomously ramose; twigs 4-gonal; leaves opposite, very entire membranous, 3–5-nerved; flowers axillary solitary or ramoso-3-chotomo-cymose.[10] (*Trop. America.*[11])

—B. H. *Gen.* 739, n. 18.—Tri. *Melast.* 8, 33, t. 2, fig. 18.—*Noterophila* Mart. *Nov. Gen. et Sp.* iii. 110, t. 254.—*Dicrananthera* Presl, *Symb.* i. 75, t. 50.—*Miocarpus* Naud. *Ann. Sc. Nat.* ser. 3, ii. 146.—*Uranthera* Naud. *loc. cit.* xii. 282.—*Anisocentrum* Turcz. *Bull. Mosc.* (1862) i. 322.

[1] DC. *Prodr.* iii. 110; *Mém. Mélast.* 22.—Endl. *Gen.* n. 6184.—Naud. *loc. cit.* xvi. 87.—B. H. *Gen.* 736, n. 4.—Tri. *Melast.* 23, t. 1, fig. 4.

[2] Cham. *Linnæa*, ix. 458.—Endl. *Gen.* n. 6180.—B. H. *Gen.* 737, n. 6.—Tri. *Melast.* 24, t. 1, fig. 6.—*Acipetalum* Turcz. *Bull. Mosc.* (1848) i. 577 (part).

[3] Cham. *Linnæa*, ix. 445.—Endl. *Gen.* n. 6213.—Naud. *loc. cit.* xvi. 86, t. 5.—B. H. *Gen.* 736, n. 5.—Tri. *Melast.* 24, t. 1, fig. 5 (a hispid Brazilian shrub).

[4] DC. *Prodr.* iii. 114; *Mém.* 26.—Endl. *Gen.* n. 6187.—Naud. *loc. cit.* xii. 203.—B. H. *Gen.* 738, n. 14.—Tri. *Melast.* 32, t. 1, fig. 14.—*Siphanthera* Pohl, *Pl. Bras. Icon.* t. 84, 85.—Naud. *loc. cit.* 205.

[5] Naud. *Ann. Sc. Nat.* ser. 3, ii. 142, t. 2; xii. 276.—B. H. *Gen.* 739, n. 16.—Tri. *Melast.* 33, t. 1, fig. 16.

[6] Bong. *Mém. Acad. S.-Pét.* ser. 6, ii. *Bot.* 137, t. 8, fig. 1.—Endl. *Gen.* n. 6194.—B. H. *Gen.* 739, n. 17.—Tri. *Melast.* 33, t. 1, fig. 17.—*Onoct nia* Naud. *loc. cit.* xii. 276, t. 12 (seed sometimes quite of *Acisanthera*).

[7] For the number and reason of the sections, see *Adansonia*, xii. *loc. supr. cit.* 71–77.

[8] Spec. about 250. Aubl. *Guian.* t. 168 (*Melastoma*).—Vent. *Ch. de Pl.* t. 34 (*Meriania*).—R. et Pav. *Fl. Per.* t. 318, 319, 321 (*Rhexia*).—Mart. *Nov. Gen. et Sp.* iii. t. 240, 242, 243, 245 (*Lasiandra*), 246, 247 (*Chætogastra*), 248 (*Marcetia*), 258 (*Meissneria*), 264 (*Chætostoma*).—B. *Rhex*, t. 1, 6, 8, 9, 13, 14, 19–27, 30, 31, 40–42, 45, 50, 57.—Benth. *Voy. Sulph. Bot.* t. 33 (*Heeria*).—Griseb. *Fl. Brit. W.-Ind.* 266.—*Bot. Mag.* t. 4007, 4262, 4412, 5629, 5721 (*Pleroma*), 5166 (*Heterocentron*).—Walp. *Rep.* ii. 124 (*Spennera*), 126 (*Fritzschia*), 127 (*Marcetia*), 128 (*Lasiandra*), 130–132; v. 700; *Ann.* ii. 549–564; iv. 696 (*Svitramia*), 808 (*Lasiandra*, *Pleroma*).

[9] *Ann. Sc. Nat.* ser. 3, xii. t. 15; xiii. 32.—B. H. *Gen.* 742, n. 29.

[10] Perhaps better a section of *Tibouchina*, allied to *Heeria* or *Arthrostemma*.

[11] Spec. 4. Bonpl. *Rhex.* t. 22 (*Rhexia*).—Benth. *Sulph.* 933 (*Heeria*).—Beurl. about

7. **Aciotis** Don.[1]—Flowers 4-merous; receptacle short tubular or subglobular. Sepals 4, short, deciduous. Petals 4, contorted, sometimes setiferous at apex. Stamens 8, 2-seriate; anthers oblong or short, 1-porous, connective at base more or less produced inappendiculate, articulated (?) with top of filament. Germen quite or nearly free, 2-celled; style slender, sometimes flexuose, not dilated at apex. Fruit membranous, opening unequally; seeds curved or cochleate foveolate.—Glabrous or pilose herbs; leaves opposite or rarely 3-nate membranous; flowers[2] in a ramose-cymiferous raceme or spike, often secund. (*Trop. south. cont. and antill. America.*[3])

8. **Brachyotum** DC.[4]—Flowers 4, 5-merous; receptacle ovoid or subhemispherical. Sepals 4, 5, marginally inserted, equal to or longer than receptacle, oblong or subulate, persistent. Petals 4, 5, unequally obovate, free but closely connivent in spuriously campanulate corolla and contorted. Stamens 8–10 (of *Tibouchina*). Germen free, 4, 5-celled, setose at vertex; style stout, not dilated at apex. Fruit capsular; seeds cochleate.—Shrubs glabrous or oftener with various clothing; leaves[5] opposite, ovate or oblong-ovate, recurved at margin, 3–5-nerved; flowers[6] at top of twigs solitary or cymose few (2, 3), drooping or cernuous, often girt at base involucrately with imbricate or decussate bracts.[7] (*Trop. South America.*[8])

9. **Microlicia** Don.[9]—Flowers 4, 5-merous or more rarely 6–8-merous (*Lavoisiera*);[10] receptacle campanulate or urceolate. Sepals subulate or setaceous, more rarely broad, generally persistent. Petals obovate or cuneate, acute or truncate at apex. Stamens 10, or more

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Kon. Vet. Ak. Handl. (1854) 124 (*Rhexia ?*).—Tri. *Melast.* 40.—Walp. *Ann.* ii. 553.

[1] *Mem. Wern. Soc.* iv. (1823) 300.—B. H. *Gen.* 744, n. 36.—Tri. *Melast.* 51, t. 3, fig. 36.—*Spennera* Mart. *DC. Prodr.* iii. 115 (1828); *Nov. Gen. et Sp.* iii. t. 255.—Endl. *Gen.* n. 6195.

[2] Small, often white.

[3] Spec. about 25. Aubl. *Guian.* 402, t. 154 (*Melastoma*).—R. et Pav. *Fl. Per.* iv. t. 327 (*Arthrostemma*).—Naud. *Ann. Sc. Nat.* ser. 3, xiv. 141, t. 5 (*Spennera*).—Miq. *Linnæa*, xviii. 273 (*Spennera*).—B. *Rhex.* t. 38, 39.—Benth. *Hook. Journ. Bot.* ii. 296 (*Spennera*).—Walp. *Rep.* ii. 137.

[4] *Prodr.* iii. 136 (*Arthrostemmatis* sect. 2).—Tri. *B. H. Gen.* 743, n. 33; *Melast.* 48, t. 3, fig. 33 (his own genus).

[5] Small, often coriaceous.

[6] Yellow, purple or bluish.

[7] Very near *Tibouchina*, differing chiefly in the form of its spuriously gamopetalous corolla.

[8] Spec. about 20. R. et Pav. *Fl. Per.* t. 318, 319, 321 (*Rhexia*).—Bonpl. *Rhex.* t. 6, 8, 13, 14, 20.—Benth. *Pl. Hartw.* 131 (*Chætogastra*).—Naud. *Ann. Sc. Nat.* ser. 3, xiv. 127, t. 4 (*Chætogastra*).—*Bot. Mag.* t. 6018.—Walp. *Ann.* ii. 585 (*Chætogastra*).

[9] *Mem. Wern. Soc.* iv. 301 (1823).—DC. *Prodr.* iii. 117.—Endl. *Gen.* n. 6197.—Naud. *Ann. Sc. Nat.* ser. 3, xii. 288.—B. H. *Gen.* 737, n. 10.—Tri. *Melast.* 25, t. 1, fig. 10.—H. Bn. *Adansonia*, xii. 95.

[10] DC. *Prodr.* iii. 102 (1828); *Mém. Mélast.* 14, t. 2.—Endl. *Gen.* n. 6172.—Naud. *loc. cit.* xii. 215.—B. H. *Gen.* 738, n. 12.—Tri. *Melast.* 29, t. 1, fig. 12.

rarely 12–16, the oppositipetalous oftener much smaller; anthers ovoid or oblong, sometimes linear, 1-porous at more or less tubular apex,[1] connective more or less produced inwardly at base beyond the insertion of the filament, curved and there generally dilated, entire or more rarely 2-lobed. Germen either free, or more or less deeply adnate within receptacle, either 3–5-celled (*Trembleya*),[2] or 3–8-celled (*Eumicrolicia*, *Lavoisiera*); style slender, often declinate or incurved, sometimes thickened towards apex (*Rhynchanthera*); at top stigmatose punctiform. Capsule 4–8-valved; seeds straight or more or less curved, sometimes foveolate.—Shrubs, shrublets, or rarely herbs, glabrous or pilose; or with glandular pilose, sometimes (*Lasiotrembleya*[3]) densely hoary indumentum; leaves often small, imbricate; flowers[4] axillary or terminal, solitary or in compound cymiferous racemes. (*Trop. South America.*[5])

10? **Cetradenia** G. Don.[6]—Flowers nearly of *Microlicia*, 4-merous; sepals 4, shorter than receptacle. Stamens 8, unequal; anthers oblong, obtuse, erostrate; connective produced at base incurved and compressed, clavate at bottom and there truncate or 2-lobed. Germen, &c., of *Microlicia*.[7]—Herbs, sometimes subshrubby; branches 4-alate or 4-gonal; leaves of each pair[8] very dissimilar; one very small (or sometimes 0); the other larger unequally lanceolate; flowers[9] in corymbiform cymes. (*South-west. North America.*[10])

11? **Chætostoma** DC.[11]—Flowers nearly of *Microlicia*, 5-merous; receptacle tubular-campanulate coriaceous sparsely setose. Sepals 5,

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[1] Often very long in *Rhynchanthera* (DC. *Prodr.* iii. 106;—Tri. *Melast.* 31, t. 1, fig. 13), but not constantly. It would be better, in our opinion, a sect. of *Microlicia;* not all the stamens (oftener only 1–5) furnished with perfect anthers.

[2] DC. *Prodr.* iii. 125; *Mém.* i. 37.—Endl. *Gen.* n. 6206.—Naud. *loc. cit.* xii. 264.—B. H. *Gen.* 738, n. 11.—Tri. *Melast.* 29, t. 1, fig. 11.

[3] Sections of *M. laniflora* H. Bn. in *Adansonia*, xii. 95.—*M. laniflora* Don, *Mem. Wern. Soc.* iv. 292 (1823).—*Trembleya Lychnitis* DC. *Prodr. loc. cit.* 126 (1828).—Tri. *loc. cit.* 29, fig. 11 *a*.—*Rhexia Lychnitis* Schr. et Mart.—*Pyramia Lychnitis* Kl.—*Hemiandra candidissima* A. Rich. (ex Tri.).

[4] White, yellow, pink or purple, moderate or sometimes large, showy.

[5] Spec. about 135. Aubl. *Guian.* 414, t. 160 (*Melastoma*).—Mart. *Nov. Gen. et Sp.* iii. t. 249, 250; 251–253 (*Trembleya*), 259, 260 (*Rhynchanthera*), 265–272 (*Lavoisiera*).—Hook. *Icon.* t. 502 (*Lavoisiera*).—B. *Rhex.* t. 59.—Walp. *Rep.* ii. 125; v. 690, 699 (*Trembleya*); *Ann.* ii. 543 (*Rhynchanthera*), 545 (*Lavoisiera*), 546; 549 (*Trembleya*).

[6] *Gen. Syst.* ii. 765.—Endl. *Gen.* n. 6178.—Naud. *Ann. Sc. Nat.* ser. 3, xii. 270.—B. H. *Gen.* 739, n. 15.—Tri. *Melast.* 32, t. 1, fig. 15.—*Plagiophyllum* Schlchtl, *Linnæa*, xiii. 429.

[7] Of which perhaps better a section.

[8] Properly opposite; the second often more or less elevated on the branches.

[9] Pink, often crowded, small.

[10] Spec. 3. *Bot. Reg.* (1843) t. 20.—*Bot. Mag.* t. 5228.—Walp. *Rep.* ii. 118, 917; v. 682; *Ann.* ii. 549.

[11] *Prodr.* iii. 112.—Endl. *Gen.* n. 6186.—Naud. *Ann. Sc. Nat.* ser. 3, xii. 227.—B. H. *Gen.* 737, n. 8.—Tri. *Melast.* 24, t. 1, fig. 8.

pungent, persistent. Petals 5, subovate acute, contorted. Stamens 10, subequal (of *Microlicia*),[1] connective shortly produced and augmented at base by two short tubercles; anthers subulate, 1-porous at apex. Germen 3-celled. Capsule 3-valved; seeds oblong, straight or curved, punctate. Other characters of *Microlicia*.—An ericoid[2] glabrous virgate shrublet; leaves (small) rigid, 6-farious, carinate acute pungent; flowers[3] terminal solitary.[4] (*Central and south. Brazil.*[5])

12? **Cambessedesia** DC.[6]—Flowers (nearly of *Chætostoma*) 5-merous; receptacle ovoid, subglobular or campanulate. Petals 5, pointed, contorted. Stamens 10, either subequal, or unequal; anthers curved subulate, 1-porous at apex; connective not produced at base, sometimes dilated-cuneate, sometimes dorsally enlarged to a longitudinally adnate stalk. Germen 3-celled, &c., of *Chætostoma;* seeds straight tubercular.—Shrubs or shrublets, glabrous or variously clothed; twigs erect, 4-gonal; leaves[7] opposite or subfasciculate, entire or serrate; flowers[8] either solitary, or in compound sometimes corymbiform cymes. (*South. Brazil.*[9])

13? **Lithobium** Bong.[10]—"Flowers 3-merous; receptacle campanulate. Sepals 3, rotund very short. Petals 3, orbicular emarginate. Stamens 5, equal; connective of anthers shortly produced at base. Germen half-free globular, 3-celled. Fruit capsular globular, 3-celled; seeds straight piriform smooth; hilum lateral.—A dimunitive glandular-pilose herb; rhizome tuberous; leaves radicle long petiolate; flowers[11] 1–3, cymose at end of scape." (*North. Brazil.*[12])

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[1] Like those only whose basilar tubercles of the connective are short, as *M. sincorensis* and allies.

[2] Habit of some *Boronieæ*.

[3] White, pink or red.

[4] A genus differing chiefly in habit from *Microlicia* (of which perhaps it is better a section). *Stenodon suberosus* (Naud. *loc. cit.* ii. 146, t. 3; xii. 215, t. 12) constitutes, with us (*Adansonia*, xii. 95), a section of this genus, differing from the rest by its indumentum as much as *Trembleya Lychnitis* from its congeners. Flowers sometimes 6, 7-merous.

[5] Spec. 6. Spreng. *Syst.* ii. 308 (*Rhexia*).—Mart. *Nov. Gen. et Sp.* iii. 128, t. 264, fig. 1.—Naud. *loc. cit.* xii. 179, 230 (*Microlicia*).—B. H. *Gen.* 737, n. 9 (*Stenodon*).—Tri. *Melast.* 25, t. 1, fig. 9 (*Stenodon*).—Walp. *Rep.* ii. 125; v. 699; *Ann.* ii. 546.

[6] *Prodr.* iii. 110 (1828).—Endl. *Gen.* n. 6185.—Naud. *Ann. Sc. Nat.* ser. 3, xv. 60.—B. H. *Gen.* 737, n. 7.—Tri. *Melast.* 24, t. 1, fig. 7.—*Acipetalum* Turcz. *Bull. Mosc.* (1848) i. 577.

[7] Oftener small, sometimes ericoid or resembling some Australian *Leguminosæ*.

[8] Somewhat resembling those of *Oxystemon*, a genus hence apparently very near *Marcetia* and *Microlicia* (as *Chætostoma*).

[9] Spec. 7, 8. B. *Rhex.* t. 56, 58, 60.—Mart. *Nov. Gen. et Sp.* iii. 125, t. 262, 263.—Walp. *Ann.* ii. 601 (*Acipetalum*).

[10] *Mém. Acad. Pétersb.* ser. 6, ii. *Bot.* 140, t. 8, fig. 2.—B. H. *Gen.* 736, n. 2.—Tri. *Melast.* 23, t. 1, fig. 1.

[11] "Purplish."

[12] Spec. 1. *L. cordatum* Bong. *loc. cit.*

14. **Castratella** NAUD.[1] — Flowers (nearly of *Lithobium*?) 4-merous; receptacle ovoid. Sepals 4, short obtuse, persistent. Petals 4, contorted, 1-setiferous at apex. Stamens 8, sub-equal; anthers oblong, attenuate at base, connective shortly produced at base, not or very slightly appendiculate. Germen free beyond middle, 4-celled. Capsule 4-valved; seeds subovoid glabrous.—A villose hispid herb; leaves all radicle rosulate, subsessile entire, 5–7-nerved; flowers[2] cymose at top of scape, often few; pedicels 2-bracteolate[3] under flower. (*Columbia.*[4])

15. **Eriocnema** NAUD.[5] — Flowers (nearly of *Castratella*) 4–5-merous; receptacle subcampanulate villose. Sepals 4–5, broad, 3-angular, dorsally 1-dentate. Petals 4–5, acute, contorted. Stamens 8–10; filaments incurved above; anthers linear basifixed, 1-porous, connective not produced nor appendiculate. Germen free, 3-celled. Capsule 3-celled, 3-valved to base; seeds straight or curved.—A perennial hirsute herb; rhizome thick; leaves radicle petiolate cordate, 3–9-nerved; flowers[6] cymose at top of scape, spuriously corymbose; pedicels bracteolate[7] at base. (*South. Brazil.*[8])

16. **Bertolonia** RADD.[9] — Flowers 5-merous;[10] receptacle campanulate more or less turbinate or tubular, externally glabrous, sulcate or costate, sometimes 3–9-alate.[11] Sepals 5, entire, serrate, or ciliate; sometimes (*Diplarpea*[12]) with as many small teeth interposed. Petals 5, ovate, obovate or oblong, much contorted. Stamens 10, 2-seriate, subequal; anthers various in form, often linear-subulate, 1, 2-porous at apex, or spuriously rimose (*Diolena*[13]) from the pore running downwards; connective not or scarcely produced at base, spurred posteriorly downward, and furnished with an ascending appendage

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[1] *Ann. Sc. Nat.* ser. 3, xiv. 139.—B. H. *Gen.* 736, n. 3.—TRI. *Melast.* 23, t. 1, fig. 3.

[2] Yellow, rather large.

[3] Flowers nearly of some *Tibouchinæ*, habit sometimes also the same. In leaves and inflorescence the genus presents a transition to the *Bertolonieæ*.

[4] Spec. 1. *C. piloselloides* NAUD.—*Rhexia piloselloides* BONPL. *Rhex.* t. 5.—*Arthrostemma piloselloides* DC. *Prodr.* iii. 136.

[5] *Ann. Sc. Nat.* ser. 3, ii. 144; xv. 330; xvi. t. 24.—B. H. *Gen.* 736, n. 1.—TRI. *Melast.* 23, t. 1, fig. 2.

[6] Small, rather pretty.

[7] A genus very near the preceding and also to some *Bertolonieæ* in habit.

[8] Spec. 2. CHAM. *Linnæa*, ix. 383 (*Bertolonia*). —WALP. *Rep.* v. 683.

[9] *Att. Soc. Ital. Scienz.* xviii. 5, fig. 3 (not SPRENG. not RAFIN. not DC.)—DC. *Prodr.* iii. 113; *Mém.* i. 25.—ENDL. *Gen.* n. 6190.—NAUD. *Ann. Sc. Nat.* ser. 3, xv. 317.—B. H. *Gen.* 756, n. 79.—TRI. *Melast.* 79, t. 6, fig. 78.—*Triblemma* MART. (ex DC.).

[10] Very rarely 4-merous.

[11] Concerning the wings as also the sepals and ovarian cells, see H. BN. *Bull. Soc. Linn. Par.* 130.

[12] TRI. ex B. H. *Gen.* 756, n. 81; *Melast.* 80, t. 6, fig. 81.

[13] NAUD. *loc. cit.* xv. 329; xvi. t. 24.—B. H. *Gen.* 756, n. 83.—TRI. *Melast.* 80, t. 6, fig. 82.

(*Eubertalonia*), anteriorly and posteriorly shortly spurred (*Diplarpea*), spurred posteriorly downwards and furnished with an ascending appendage (*Aulacidium*[1]), sometimes only posteriorly spurred (*Salpinga*[2]), or with an anterior obtuse linear appendage (*Monolena*[3]); anterior appendages of connective 2, equal (*Diolena*) or more rarely (*Triolena*[4]) 2, 3, equal or more or less unequal.[5] Germen 3-locular, free or at base more or less adnate to receptacle; placenta short, thick, or rarely narrower oblong obliquely ascending.[6] Capsule sometimes crowned with persistent style, 3-quetrous, 3-gonal, or 3-alate, enclosed by receptacle, vertically depressed or widely hollowed, and often with 3 thick rigid scales bordering the depression; seeds straight, oblong, obovoid or pyramidal. Herbs, sometimes slender, glabrous or variously pilose, ciliate or crinite; stem often simple or sparsely ramose, generally short or very short, rather fleshy; leaves entire or serrate, sometimes unequal, 3–5- or more rarely 7-nerved; flowers[7] at summit of scape in cymes often furcate, generally scorpioid. (*Trop. South America, Mexico.*[8])

17 ? **Gravesia** Naud.[9]—Flowers (nearly of *Bertolonia*) 5-merous; receptacle turbinate or campanulate, produced beyond the germen more or less adnate within. Calyx dilated, truncate or 5-dentate, deciduous. Petals 5, ovate or obovate. Stamens 10, equal or more or less unequal; anthers 1, 2-form, 1-porous at apex; connective not produced (*Eugravesia*) or shortly (*Calvoa*[10]) or long (*Amphiblemma*[11]) produced, internally appendiculate at base. Germen 5, more rarely, (*Calvoa*) 3-locular. Fruit capsular coriaceous (sometimes at maturity parenchyma of receptacle separate), widely hollowed at apex 3–5-valved. Seeds straight, oblong or obovoid; hilum subbasilar; raphe produced beyond nucleus in a tumid aril.[12] Other characters of *Bertolonia*.—

[1] Rich. ex DC. *Prodr.* iii. 112.—*Macrocentrum* Hook. f. *Gen.* 756, n. 80.—Tri. *Melast.* 79, t. 6, fig. 79.

[2] Mart. *Nov. Gen. et Sp.* iii. 114, t. 256.—DC. *Prodr.* iii. 112.—Endl. *Gen.* n. 6189.—Naud. *loc. cit.* xv. 316 (part).—B. H. *Gen.* 755, n. 78.—Tri. *Melast.* 80, t. 6, fig. 80.

[3] Tri. ex B. H. *Gen.* 756, n. 82; *Melast.* 80, t. 6, fig. 82.

[4] Naud. *loc. cit.* xv. 328; xvi. t. 18.—B. H. *Gen.* 757, n. 84.—Tri. *Melast.* 81, t. 6, fig. 84.

[5] H. Bn. *Adansonia*, xii. 93.

[6] And then quite resembling those of some *Astroniæ*.

[7] Pink or white.

[8] Spec. about 20. B. *Rhex.* t. 53–55.—Hook. *Bot. Mag.* t. 4551.—Hook. f. *Bot. Mag.* t. 5818 (*Monolena*).—Pl. *Fl. des Serr.* t. 750.—Benth. *Voy. Sulph. Bot.* 94.—Walp. *Rep.* v. 638; *Ann.* ii. 600; iii. 883.

[9] *Ann. Sc. Nat.* ser. 3, xii. t. 10 (1849); xv. 333.—B. H. *Gen.* 755, n. 76.—Tri. *Melast.* 78, t. 6, fig. 75.—H. Bn. *Adansonia*, xii. 93.

[10] Hook. f. *Gen.* 755, n. 77.—Tri. *Melast.* 78, t. 6, fig. 76.

[11] Naud. *loc. cit.* xiv. t. 7; xv. 50.—B. H. *Gen.* 754, n. 75.—Tri. *Melast.* 79, t. 6, fig. 77.

[12] *Veprecella* (Naud. *lo. cit.* xv. 312, t. 15.—Tri. *Melast.* 74, t. 6, fig. 68), a genus "one day to be revised, the species hardly agreeing" (B. H. *Gen.* 752, n. 67), and hitherto referred to the *Oxysporeæ*; as regards species better known

Shrublets or herbs, glabrous or pilose; leaves petiolate ovately oblong, 5–7-nerved, oftener serrate; flowers[1] sometimes in umbelliform, oftener scorpioid cymes. (*Trop. West Africa, Madagascar.*[2])

18. **Sonerila** Roxb.[3]—Flowers 3-merous; receptacle tubular or turbinate. Sepals 3, short, contorted. Petals 3, alternate, various in form, contrariwise contorted. Stamens 3, alternipetalous, or very rarely 6, the smaller oppositipetalous; anthers 1, 2-porous at apex; cells at base often discrete; connective not or scarcely produced, sometimes 2-tuberculate. Germen inferior, sometimes free at hollowed apex; cells 3, alternipetalous; the 3 margins dilated to a scale; style slender, truncate or capitate at apex. Capsule enclosed in receptacle, dividing into 3 valves, squamiform at margin; seeds ∞, very various in form, pyramidally clavate, ovoid or reniform; raphe sometimes rather prominent.—Shrublets or herbs, glabrous or hirsute; leaves equal or 2-morphous, opposite, entire, or serrulate, 3–5-nerved; flowers[4] in a scapelike scorpioid cymiferous raceme. (*Trop. cont. and ins. Asia.*[5])

19. **Sarcopyramis** Wall.[6]—Flowers 4-merous; receptacle shortly obpyramidal. Calyx shortly 4-dentate, teeth ciliate. Petals 4, ovately acuminate. Stamens 8, subequal; anthers ovate, 2-lobed at apex, dehiscing by a pore in the hollow between lobes; connective produced below anther, slender and posteriorly obtusely spurred at base. Germen adnate to middle of receptacle, 4-locular, 4-lobed at hollowed apex; style slender, thickening at stigmatose apex. Fruit enclosed in sub-fleshy receptacle, 4-lobed at concave apex and there 4-valved; seeds straight, granular; hilum basilar.—A simple or sparsely ramose glabrous fleshy herb; stem 4-gonal; leaves opposite

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it appears to us only a section of *Gravesia*. The stamens either of *Eugravesia*, or nearly of *Amphiblemma*, and the seed where known (e. g. of *Veprecella macrophylla* Naud.) quite of *Gravesia*; the white tumid aril of the raphe produced beyond the hilum.

[1] Pink (or yellow ?), often beautiful.

[2] Spec. about 12. Vent. *Malmais.* t. 14 (*Melastoma*).—DC. *Prodr.* iii. 147 (*Melastoma*).—Sims *Bot. Mag.* t. 904, 5473 (*Melastoma*).—Hook. *Bot. Mag.* t. 5524 (*Bertolonia*).—Hem. *Jard. Fl.* t. 1695 (*Bertolonia*).—Lodd. *Bot. Cab.* t. 984 (*Melastoma*).—Hook. f. *Oliv. Fl. Trop. Afr.* ii. 455 (*Amphiblemma*), 457 (*Calvoa*). — Walp. *Ann.* iii. 822 (*Veprecella*), 887.

[3] *Fl. Ind.* i. 376.—Endl. *Gen.* n. 6192.—Naud. *Ann. Sc. Nat.* ser. 3, xv. 319; xvi. t. 18.—B. H. *Gen.* 753, n. 72.—Tri. *Melast.* 75, t. 6, fig. 72.—Hook. *Fl. Ind.* ii. 529.

[4] Oftener pink, showy.

[5] Spec. about 50. Royle, *Ill.* t. 45.—Wall. *Pl. As. Rar.* ii. 202.—Benn. *Pl. Jav. Rar.* t. 44.—Wight, *Ill.* t. 94; *Ic.* t. 995.—Miq. *Fl. Ind.-Bat.* i. p. 1, 561.—Korth, *Verh. Nat. Gesch. Bot.* t. 52, 54.—Thw. *Enum. Pl. Zeyl.* 107.—Bedd. *Trans. Linn. Soc.* xxv. 217.—*Bot. Mag.* t. 4978, 5026, 5104, 5354.—Walp. *Rep.* ii. 122; v. 684; *Ann.* i. 296; ii. 600; iii. 884.

[6] *Tent. Fl. Nepal.* 32, t. 23.—DC. *Prodr.* iii. 485.—Endl. *Gen.* n. 6262.—B. H. *Gen.* 754, n. 73.—Tri. *Melast.* 77, t. 5, fig. 74.—Hook. *Fl. Ind.* ii. 540.

petiolate ovate or shortly lanceolate serrulate, 3-nerved; flowers[1] in terminal and axillary cymiferous capitules, pedunculate or subsessile. (*Java, mount. and temp. India and Burma.*[2])

20. **Phyllagathis** Bl.[3]—Flowers (nearly of *Sarcopyramis*) 3, 4-merous; receptacle longer. Sepals 3, 4, more or less ciliately setose. Petals 3, 4, ovate-acute. Stamens 4–8; anthers subulate; connective not produced, at base dorsally not or scarcely spurred. Germen adnate to receptacle below, 3, 4-locular, widely hollowed at apex. Fruit enclosed by thick coriaceous receptacle, at apex deeply hollowed in 4 valves; seeds, &c. of *Sarcopyramis*.—Dense shrublets; branches herbaceous; leaves opposite,[4] large petiolate ovately orbiculate, at base cordate, obtuse entire or dentate variegated, 5–7-nerved; petiole often crinite; flowers[5] in a glomeruliferous capitule involucrate[6] with broad bracts.[7] (*Malaya.*[8])

21. **Rousseauxia** DC.[9]—Flowers 4-merous; receptacle tubular campanulate glabrous. Sepals 4, ovately acute, ciliate, much contorted. Petals 4, obovate, contrariwise contorted. Stamens 8, 2-seriate, subequal; filaments short compressed; anthers longer, much inflexed in bud, elongate obtuse, 1-porous at apex, cells glabrous not undulate; connective not produced not appendiculate. Germen adnate to receptacle by means of septa interposed between stamens, 4-celled, setose at vertex; style slender deflexed, at apex stigmatose not dilated. Fruit capsular; seeds . . . ?—A shrub; twigs articulate annular at nodes; leaves opposite petiolate, ovately acute serrulate, glabrous; lateral nerves nearly parallel to margin; flowers[10] few in terminal cymes.[11] (*Madagascar.*[12])

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[1] Small, pink.

[2] Spec. 4. *S. nepalensis* Wall.—*S. javanensis* Zoll. et Mor. *Verz.* 12.—*S. grandiflora* Griff. *Notul.* iv. 678.—*S. lanceolata* Wall. *loc. cit.*—Benn. *Pl. Jav. Rar.* 214.—*Sonerila Naudiniana* Miq. *Fl. Ind.-Bat.* i. 565.—*Osbeckia ovata* Zoll. *Flora* (1847), 665.

[3] *Flora* (1831), 507; *Mus. Ludg.-Bat.* i. 12.—Endl. *Gen.* n. 6256.—Naud. *Ann. Sc. Nat.* ser. 3, xv. 332.—B. H. *Gen.* 734, n. 74.—Tri. *Melast.* 77, t. 6, fig. 73.—Hook. *Fl. Ind.* ii. 541.

[4] One terminal, sometimes, as said, solitary.

[5] Small, pink.

[6] Said to be bare, in *P. gymnantha* Korth.

[7] A genus distinct from the preceding chiefly by its longer receptacle and the singular nature of its inflorescence.

[8] Spec. 2. Jack, *Trans. Linn. Soc.* xiv. 11 (*Melastoma*).—Korth. *Verh. Nat. Gesch. Bot.* 252, t. 57.—Walp. *Rep.* v. 717; *Ann.* iii. 886.

[9] *Prodr.* iii. 152; *Mém. Mélast.* 54 (part).—Endl. *Gen.* n. 6226.—Naud. *Ann. Sc. Nat.* ser. 3, xiv. t. 7; xv. 49.—B. H. *Gen.* 753, n. 68.—Tri. *Melast.* 74, t. 5, fig. 69.

[10] Moderate.

[11] A gen. *Blastus*, connecting the *Oxysporeæ* with the *Sonerileæ*, and yet by the nature of its flowers resembling the legitimate *Melastomeæ*.

[12] Spec. 1. *R. chrysophylla* DC. *loc. cit.* 153, n. 1.—*M. chrysophylla* Desrx. *Lamk. Dict.* iv. 50, n. 52 (not Rich.).—Walp. *Ann.* iii. 867.

22. **Oxyspora** DC.[1]—Flowers 4-merous; receptacle cylindrical or subcampanulate, externally glabrous. Sepals 4, 5, sometimes with a small dorsal tooth. Petals pointed. Stamens 8–10, more or less unequal, or very rarely 4; anthers curved, 1-porous at apex, shortly 2-lobed at base; connective at base more or less (sometimes very shortly) spurred posteriorly. Germen 3, 4-celled, deeply adnate to receptacle by septa or only at base (*Allomorphia*[2]); style slender declinate, at apex stigmatose punctiform. Capsules obovoid or subclavate, enclosed in costate receptacle, 3, 4-valved; seeds straight subclavate angular; raphe lateral or subbasilar.—Shrubs or undershrubs, sometimes subscandent, glabrous or furfuraceous; leaves long-petiolate, wide, entire, sinuate or dentate, 5–7-nerved; flowers[3] in terminal or more rarely subradicle very compound ramose cymiferous racemes. (*India, Malaya.*[4])

23. **Bredia** Bl.[5]—Flowers 4-merous; receptacle turbinate or subcampanulate. Sepals 4, obovate, contorted. Stamens 8, unequal; anthers incurved linear-elongate, 1-porous at apex, connective surrounded anteriorly by two setose appendages, and posteriorly by a rather large or short tubercular spur (*Barthea.*[6]) Germen adnate to receptacle to middle or higher by means of septa, 4-celled; style declinate, at apex stigmatose punctiform. Capsule 4-valved; seeds . . . ?—Shrubs, sometimes climbing, glabrous or hirsute; leaves unequal petiolate, ovate or lanceolate, serrulate, 3–5-nerved; flowers[7] in terminal cymes, sometimes (*Barthea*) few-flowered. (*China, Japan.*[8])

24. **Blastus** Lour.[9]—Flowers 4, 5-merous; receptacle oftener subcampanulate, sometimes sub-4-gonal (*Driessenia.*[10]) Calyx oftener

[1] *Prodr.* iii. 123; *Mém. Mélast.* i. 33, t. 4.—Endl. *Gen.* n. 6203.—Naud. *Ann. Sc. Nat.* ser. 3, xv. 306.—B. H. *Gen.* 751, n. 61.—Tri. *Melast.* 73, t. 6. fig. 62.—Hook. *Fl. Ind.* ii. 525.—*Homocentria* Naud. *loc. cit.* xv. 308, t. 15.—*Allozygia* Naud. *loc. cit.* 309, t. 15.—*Hylocharis* Miq. *Fl. Ind.-Bat.* Suppl. i. 319 (ex Tri.).

[2] Bl. *Flora* (1831), 522.—Naud. *loc. cit.* xv. 310.—B. H. *Gen.* 752, n. 64.—Tri. *Melast.* 74, t. 6, fig. 66.

[3] Moderate or very small, pink.

[4] Spec. 8. Roxb. *Fl. Ind.* 404 (*Melastoma*).—Don, *Mem. Wern. Soc.* iv. 299; *Prodr. Fl. Nep.* 222 (*Arthrostemma*).—Wall. *Pl. As. Rar.* i. t. 88.—Benth. *Fl. Hongk.* 116 (*Oxyspora*).—Naud. *A. Gray Un. St. Expl. Exp. Bot.* i. 597 (*Anplectrum*).—Hook. *Bot. Mag.* t. 4553 (*Arthrostemma*).—Walp. *Rep.* ii. 127; 143, 918 (*Allomorphia*); *Ann.* ii. 601.—Hook. *Fl. Ind.* ii. 527.

[5] *Mus. Lugd.-Bat.* i. 25, fig. 4.—Naud. *Ann. Sc. Nat.* ser. 3, xv. 284.—B. H. *Gen.* 753, n. 71.—Tri. *Melast.* 73, t. 6, fig. 63.

[6] Hook. f. *Gen.* 751, n. 62.—Tri. *Melast.* 73, t. 6, fig. 61.

[7] Pink or white externally.

[8] Spec. 3. Hance, *Benth. Fl. Hongk.* 115 (*Dissochæta?*).—Reg. *Gartenfl.* (1870) 193, t. 655.

[9] *Fl. Cochinch.* (ed. 1790) 526.—Seem. *Journ. Bot.* i. 281.—B. H. *Gen.* 752, n. 65.—Tri. *Melast.* 73, t. 6, fig. 65.—Hook. *Fl. Ind.* ii. 528.

[10] Korth. *Verh. Nat. Gesch.* 221, t. 53.—Naud. *Ann. Sc. Nat.* ser. 3, xv. 283, t. 4.—B. H. *Gen.* 753, n. 69.—Tri. *Melast.* 73, t. 6, fig. 64.

gamophyllous, lobes moderate or minute. Petals obtuse or more rarely pointed (*Anerincleistus*,[1] *Ochthocharis*[2]), much contorted. Stamens 4, alternipetalous (*Eublastus*,[3]) or oftener 8, very (*Driessenia*) or little unequal (*Ochthocharis*, *Anerincleistus*); anthers elongate subulate, 1-porous at apex; connective dilated at base and furnished with 1 rather long thin slender dorsal and 2 often short obtuse or subnil ventral appendages. Germen by means of septa more or less adnate to receptacle, 4, 5-celled, at vertex more or less depressed or hollowed; style slender, at apex stigmatose punctiform. Fruit capsular, girt or enclosed by receptacle, 4, 5-valved; seeds oftener obovoid-cuneate, sometimes (*Eublastus*) more or less curved.—Glabrous or more rarely (*Anerincleistus*) tomentose shrubs, sometimes subherbaceous (*Driessenia*); leaves opposite, entire, sinuate or denticulate; flowers[4] fasciculate in axillary or very rarely terminal cymes.[5] (*Malaya*, *East India*, *Cochin China*, *China*.[6])

25. **Kendrickia** Hook. f.[7]—Flowers 4-merous; receptacle turbinate obtusely 4-gonal. Sepals short obtuse fleshy. Petals roundly obovate, contrariwise contorted. Stamens 10, subequal; anthers thick, produced externally at base to a conical spur.[8] Germen to middle adnate to receptacle, 4–6-celled; style slender, at apex stigmatose minute; ovules ∞, inserted on slightly prominent placentæ. Fruit capsular, finally (from disappearance of septa) sub-1-celled, 4–6-valved at apex; seeds ∞, "small prismatic."—A high-climbing[9] glabrous shrub; leaves somewhat fleshy oblong-obovoid entire, 3-nerved; flowers[10] cymose at top of twigs; cymes umbelliform; pedicels 3-bracteolate. (*Ceylon*.[11])

26. **Medinilla** Gaudich.[12]—Flowers 4–6-merous; receptacle tur-

[1] Korth. *loc. cit.* 250, t. 68.—B. H. *Gen.* 753, n. 70.—Tri. *Melast.* 75, t. 5, fig. 71.—Hook. *Fl. Ind.* ii. 529.

[2] Bl. *Flora* (1831), 523; *Mus. Lugd.-Bat.* i. 39.—Naud. *loc. cit.* xv. 306, t. 15.—B. H. *Gen.* 752, n. 66.—Tri. *Melast.* 74, t. 6, fig. 67.—Hook. *Fl. Ind.* ii. 528.

[3] *Blastus* of authors.—Tri. *loc. cit.*

[4] Minute, inconspicuous.

[5] Anthers in all sections cited above certainly of the same character; the basilar appendages only differing in size and thickness.

[6] Spec. about 8. Korth. *op. cit.* t. 64 (*Ochthocharis*).—Benth. *Fl. Hongk.* 116 (*Anplectrum*).—Wall. *Cat.* n. 4087 (*Melastoma*).—Teysm. et Binn. *Nat. Tijdschr.* xxv.—Miq. *Ann. Mus. Lugd.-Bat.* i. 216 (*Ochthocharis*).—Bl. *Mus. Lugd.-Bat.* i. 13 (*Driessenia*), 40 (*Ochthocharis*).—Hook. f. Herb. *Helfer*, n. 2304 (*Anerincleistus*).—Walp. *Rep.* v. 681 (*Anerincleistus*, *Ochthocharis*), 687 (*Driessenia*).

[7] *Gen.* 751, n. 63.—Tri *Melast.* 75, t. 5, fig. 70.—Hook. *Fl. Ind.* ii. 526.

[8] Superior in the bud, compressed and with all other spurs contorted before anthesis.

[9] Spuriously parasitic.

[10] Rather large, pink.

[11] Spec. 1. *K. Walkeri* Hook. f.—*Medinilla? Walkeri* Gardn. *Calc. Journ. Nat. Hist.* viii. 11.—Wight, *Ill.* i. 217.—*Pachycentria Walkeri* Thw. *Enum. Pl. Zeyl.* 107.

[12] *Freycin. Voy. Bot.* 484, t. 106.—DC. *Prodr.*

binate, campanulate or ovoid, sometimes (*Pachycentria* [1]) constricted beyond germen, lageniform. Calyx more or less dilated, 4–6-dentate, sometimes furnished externally below the margin with small or rarely elongate-subulate (*Carionia* [2]) teeth, sometimes after anthesis free at base (*Pachycentria*). Petals 4–6, pointed, much contorted, often deciduous, somewhat fleshy. Stamens 8–12, 2-seriate, subequal or slightly unequal; anthers various in form, 1, 2-porous or shortly rimose at apex; connective not or very slightly produced at base, internally 2-tuberculate or shortly 2-lobed at base, externally short- and oftener thick-spurred. Germen 4–6-celled, by septa more or less adnate to receptacle, at apex crowned with a more or less depressed ring or with scales; style slender, sometimes dilated to base, at apex stigmatose truncate or punctiform. Fruit baccate, crowned with calyx, ovoid or globular; seeds straight, ovoid or dimidiate, smooth or rough; raphe sometimes incrassate arillose.—Erect or climbing shrubs, sometimes rather fleshy or epiphytal; pubescence sometimes starred (*Hypenanthe*); branches glabrous or scurfy, generally nodose; leaves opposite or verticillate, sometimes unequal or alternate, entire fleshy, 3-5–9-nerved, sometimes but rarely penninerved; flowers [3] in terminal or lateral more or less compound-ramose, sometimes corymbiform or few-flowered (*Carionia*) cymes. (*India, Malaya, warm Oceania, trop. west. Africa, Malacca.*[4])

27 ? **Pogonanthera** Bl.[5]—Flowers nearly of *Medinilla*, smaller, 4-merous; receptacle lageniform or cyathiform, externally pulverulent. Petals 4, longer than calyx, acuminate, dilated to middle or 1-dentate. Stamens 8, scarcely unequal; anthers oblong straight, at apex pointed 1-porous; connective not produced, not or obscurely spurred,

iii. 167.—Naud. *Ann. Sc. Nat.* ser. 3, xv. 285, t. 12, 13.—Endl. *Gen.* n. 6236.—B. H. *Gen.* 750, n. 93.—Tri. *Melast.* 85, t. 7, fig. 94.—Hook. *Fl. Ind.* ii. 546.—*Triplectrum* Don, ex Wight et Arn. *Prodr.* i. 324.—*Diplogenea* Lindl. *Brand. Quart. Journ.* (1828) 122.—Naud. *loc. cit.* xv. 297, t. 13.—*Erpetina* Naud. *loc. cit.* xv. 299, t. 14.—*Hypenanthe* Bl. *Mus. Ludg.-Bat.* i. 21.—*Dactyliota* Bl. *loc. cit.* 21.

[1] Bl. *Flora* (1831), 519; *Nat. Wett.* 260; *Mus. Lugd.-Bat.* i. 22.—Endl. *Gen.* n. 6238.—Naud. *loc. cit.* xv. 209.—B. H. *Gen.* 760, n. 95.—Tri. *Melast.* 89, t. 7, fig. 95.—H. Bn. *Adansonia*, xii. 92.

[2] Naud. *loc. cit.* ser. 3, xv. 311, t. 15.—B. H. *Gen.* 759, n. 94.—Tri. *Melast.* 85, t. 7, fig. 91.

[3] Pink or whitish, large (*Carionia*), often moderate, showy, sometimes (*Pachycentria*) small.

[4] Spec. about 60. Bl. *Rumphia* i. t. 1–3.—Miq. *Fl. Ind.-Bat.* i. p. i. 538, 550 (*Pachycentria*).—Korth. *Verh. Nat. Gesch.* t. 61, 63 (*Pachycentria*).—Seem. *Fl. Vit.* 88.—A. Gray, *Unit. St. Expl. Exp. Bot.* i. t. 75.—Naud. *loc. cit.* xv. 303, t. 15 (*Aplectrum*).—Thw. *Enum. Pl. Zeyl.* 106.—Hook. f. *Oliv. Fl. Trop. Afr.* ii. 460.—Hook. *Bot. Mag.* t. 4231, 4533, 4569, 4650.—Walp. *Rep.* ii. 142, 143 (*Pachycentria*); v. 711, 712 (*Pachycentria*); *Ann.* ii. 604, 605 (*Hypenanthe*), 606 (*Dactyliota, Pachycentria*); iii. 875; iv. 808.

[5] *Flora* (1831), 520; *Mus. Lugd.-Bat.* i. 24.—Endl. *Gen.* n. 6239.—Naud. *Ann. Sc. Nat.* ser. 3, xv. 302, t. 15.—B. H. *Gen.* 760, n. 96.—Tri. *Melast.* 89, t. 7, fig. 86.—Hook. *Fl. Ind.* ii. 550.

dorsally furnished with ∞ elongate and apically obtuse or inflated hairs. Germen semiadherent to receptacle, hirsute at apex, 4-celled. Fruit baccate, crowned with sepals and tube of receptacle; seeds ∞, oblong smooth.—Scaly shrubs;[1] leaves opposite petiolate oblong entire glabrous; flowers[2] in terminal ramose compound racemes.[3] (*Ind. Archip.*[4])

28. **Dissochæta** Bl.[5]—Flowers 4- or more rarely 5-merous (*Sakersia*,[6] *Dicellandra*[7]); receptacle campanulate or turbinate. Calyx 4, 5-lobed or dentate, sometimes subentire, more rarely calyptrately circumcissus (*Dalenia*[8]); accessory teeth small sometimes 4, 5, or oftener 0. Stamens same[9] in number as petals or generally 8–10; anthers thick oblanceolate, more or less undulate or reticulate (*Omphalopus*[10]), connective at base internally exappendiculate, simply or slightly appendiculate, posteriorly (generally shortly) spurred (*Creochiton*,[11] *Anplectrum*[12]); either long ovately acute; connective anteriorly 2-setose or 2-lamellate (*Eudissochæta*), more rarely not appendiculate *Anoplodissochæta*[13]), posteriorly generally spurred (*Eudissochæta*); or narrower, longer pointed, more or less curved (*Dicellandra*, *Sakersia*); connective produced, anteriorly 2-spurred, posteriorly bare (*Sakersia*) or with short acute spur (*Dicellandra*), sometimes anteriorly and posteriorly exappendiculate; with subulate lateral appendages (*Oxyotandra*[14]). Germen 4, 5-celled, adnate to receptacle, often crowned with epigynous disk, or concave at apex, 5–10-gonal, more rarely (*Anplectrum*) 4-cristate; style simple, sometimes dilated at base, at apex stigmatose truncate or punctiform. Fruit baccate or coriaceous, generally ovoid; seeds various in form, either straight, or more rarely

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[1] Sometimes spuriously parasitic.

[2] Red or pink, small, crowded.

[3] A genus differing from the small-flowered *Medinillas* only in the character of the stamens.

[4] Spec. 2. Korth. *Verh. Nat. Gesch.* t. 65.—Jack, *Trans. Linn. Soc.* xiv. 19 (*Melastoma*).—Bl. *Bijdr.* 1072 (*Melastoma*).—Wall. *Cat.* n. 4086 (*Melastoma*).—Walp. *Rep.* ii. 143; v. 712; *Ann.* ii. 606.

[5] *Flora* (1831), 493 (part); *Mus. Ludg.-Bat.* i. 35, t. 5.—Endl. *Gen.* n. 6246 (part).—Naud. *Ann. Sc. Nat.* ser. 3, xv. 72 (part), t. 4, fig. 3, 4.—B. H. *Gen.* 758, n. 89.—H. Bn. *Adansonia*, xii. 88.—Hook. *Fl. Ind.* ii. 543.

[6] Hook. f. *Gen.* 757, n. 85; *Oliv. Fl. Trop. Afr.* ii. 458.—Tri. *Melast.* 81, t. 7, fig. 86.

[7] Hook. f. *Gen.* 757, n. 86; *Oliv. Fl. Trop. Afr.* ii. 459.—Tri. *Melast.* 81, t. 7, fig. 85.

[8] Korth. *Verh. Nat. Gesch.* 243, t. 58.—Naud. *loc. cit.* xv. 276.—B. H. *Gen.* 758, n. 88.—Tri. *Melast.* 82, t. 7, fig. 87.

[9] E. g. *D. Diepenhorstii* Miq.

[10] Naud. *loc. cit.* xv. t. 4 (part).—B. H. *Gen.* 759, n. 92.—Tri. *Melast.* 85, t. 7, fig. 92.

[11] Bl. *Flora* (1831), 506.—Endl. *Gen.* n. 6255.—Naud. *loc. cit.* xviii. 153, t. 6.—B. H. *Gen.* 758, n. 91.

[12] A. Gray, *Un. St. Expl. Exp. Bot.* i. 597.—B. H. *Gen.* 758, n. 90.—Tri. *Melast.* 84, t. 7, fig. 90.—Hook. *Fl. Ind.* ii. 545.—*Aplectrum* Bl. *Flora* (1831), 502; *Mus. Lugd.-Bat.* i. 37.—Endl. *Gen.* n. 6247 (not Nutt.).

[13] The type of which is *D. inappendiculata* Bl.

[14] H. Bn. *Adansonia*, xii. 88.

slightly curved.—Erect or oftener sarmentose shrubs, sometimes but rarely subherbaceous (*Dicellandra*), glabrous or scaly; leaves oftener entire, 3–5-nerved; flowers[1] in more or less compound racemose cymes, terminal and axillary or lateral; lateral bracteoles small, but sometimes (*Creochiton*) wide navicular, fleshy or coriaceous, valvately enfolding the bud, deciduous. (*Asia, trop. Oceania and Africa, Malacca.*[2])

29. **Marumia** Bl.[3]—Flowers nearly of *Medinilla*, 4-merous; receptacle tubular or subcampanulate, externally setose or plumose. Sepals 4, 3-angular or lanceolate, reduplicately valvate, thick, persistent. Petals 4, obovate, contorted. Stamens 8; the alternipetalous longer; connective long produced at base, internally long 2-setose, but externally often setose or variously spurred; the oppositipetalous smaller; connective less or scarcely produced, internally more shortly 2-setose, externally more sparsely setose or bare; anthers of all elongately subulate, curved subrostrate, at apex attenuate 1-porous. Germen more or less free, setose or pilose above; style slender, at apex stigmatose truncate. Fruit baccate clothed with receptacle and calyx; seeds ∞, ovoidly dimidiate; raphe more or less laterally prominent. — Sarmentose shrubs, sometimes climbing; indumentum tomentose or scaly, oftener abundant; branches thickened at nodes; leaves opposite petiolate entire, 3–5-nerved; flowers[4] in lateral pedunculate cymes. (*Philippine and Malayan islands.*[5])

30. **Monochætum** DC.[6]—Flowers 4-merous;[7] receptacle tubular or subcampanulate. Sepals 4, ovately acute or lanceolate, subequal to or shorter than receptacle. Petals 4, unsymmetrically obovate,

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[1] White, pink or purple.

[2] Spec. about 30. Bl. *Bijdr.* 1068, 1074 (*Melastoma*).—Jack, *Trans. Linn. Soc.* xiv. 12, 14 (*Melastoma*).—Korth. *Verh. Nat. Gesch.* t. 55, 56.—Miq. *Fl. Ind.-Bat.* i. p. i. 521, 531 (*Omphalopus*), 559 (*Creochiton*).—Walp. *Rep.* ii. 144, 145 (*Aplectrum*); v. 715 (*Dalenia*), 717; *Ann.* ii. 607, 608 (*Aplectrum, Dalenia*); iv. 796 (*Creochiton*).

[3] *Flora* (1831), 503; *Mus. Ludg.-Bat.* i. 33.—Endl. *Gen.* n. 6254.—Naud. *Ann. Sc. Nat.* ser. 3, xv. 279, t. 12.—B. H. *Gen.* 755, n. 87.—Tri. *Melast.* 82, t. 6, fig. 88.—Hook. *Fl. Ind.* ii. 541. —*Macrolenes* Naud. *loc. cit.* 311.

[4] Pink or red, sometimes rather large.

[5] Spec. about 10. Vent. *Choix de Pl.* t. 32 (*Maieta*).—Miq. *Fl. Ind.-Bat.* i. p. 1, 532.—Korth. *Ver. Nat. Gesch.* t. 59, 60.—Jack, *Trans. Linn. Soc.* xiv. 6 (*Melastoma*).—DC. *Prodr.* iii. 167, n. 4 (*Huberia*).—Bl. *Rumphia*, i. t. 4, 5.—Walp. *Rep.* ii. 145; *Ann.* ii. 609; iii. 874.

[6] *Prodr.* iii. 138 (*Arthrostemmatis* sect. 5).—Naud. *Ann. Sc. Nat.* ser. 3, iv. 48, t. 2; xiv. 157. —B. H. *Gen.* 747, n. 48.—Tri. *Melast.* 62, t. 5, fig. 49.—H. Bn. *Adansonia*, xii. 95.—*Lævigia* Karst. et Tri. *Linnæa*, xxviii. 434.—*Grischowia* Karst. *Ausw. N. Gew.* 15, t. 5.

[7] Very rarely 5-merous.

much contorted. Stamens 8, 2-seriate; filaments glabrous; anthers 2-form, much inflexed, vertical in bud; the oppositipetalous larger subulate, 1-porous at apex; connective externally produced at base in a thick subclavate mass; connective of the shorter (paler) (often sterile) alternipetalous longer and more slender. Germen to middle more or less adnate to receptacle, 4-celled, at vertex setose or villose; style inserted in depression at top of germen, slender,[1] at apex stigmatose not dilated. Fruit capsular, enclosed in receptacle, 4-valved; seeds ∞, curved or cochleate.—Branched sometimes tomentose shrubs or undershrubs; leaves ovate or lanceolate, 3–7-nerved, entire or serrulate; flowers[2] terminal, solitary or cymose, often few. (*Both trop. west. Americas.*[3])

31. **Rhexia** L.[4]—Flowers 4-merous; receptacle campanulate or urceolate. Sepals 4, 3-angular. Petals 4, obovate. Stamens 8, subequal; filaments incurved; anthers elongate obtuse, at apex sometimes dilated 1-porous; connective not produced at base, oftener incrassate, posteriorly furnished with short subulate appendage to base. Germen free, 4-celled; style slender, at apex stigmatose truncate. Capsule enclosed in ventricose receptacle, 4-valved; seeds straight, curved or cochleate, smooth or rough.—Herbs, sometimes subshrubby at base, generally setosely glandular; leaves petiolate, entire or serrulate, 3-nerved; flowers[5] solitary or cymose. (*South-east. North America.*[6])

32. **Miconia** R. and Pav.[7]—Flowers generally 4, 5-merous, more rarely 6–8-merous; receptacle globular, campanulate, sometimes

[1] Finally declinate contrariwise to stamens.

[2] Moderate, pink or violet.

[3] Spec. about 20. B. *Rhex.* t. 3, 16, 18.—Deless. *Ic. Sel.* v. t. 4.—Spreng. *Syst.* ii. 309 (*Rhexia*).—R. et Pav. *Fl. Per.* iii. t. 380, fig. *a* (*Rhexia*).—Don, *Mem. Wern. Soc.* iv. 299 (*Arthrostemma*).—Benth. *Pl. Hartw.* 181 (*Chætogastra*).—L. Neum. *Rev. Hort.* (1861) 211.—Schlchtl, *Linnæa*, xiii. 431 (*Rhexia*).—*Bot. Mag.* t. 5132, 5341, 5367, 5506.—Walp. *Rep.* v. 701; *Ann.* ii. 506; iv. 808.

[4] *Gen.* n. 468.—J. *Gen.* 330.—Nutt. *Gen.* i. 243.—DC. *Prodr.* iii. 121 (part).—Endl. *Gen.* n. 6200.—Naud. *Ann. Sc. Nat.* ser. 3, xv. 63.—B. H. *Gen.* 747, n. 49.—Tri. *Melast.* 61, t. 5, fig. 48.

[5] White or pink, sometimes handsome.

[6] Michx. *Fl. Bor.-Amer.* i. 222.—Pursh. *Fl. Bor.-Amer.* i. 258.—Walt. *Fl. Carol.* 129.—Desvx. *Ham. Prodr.* 35.—B. *Rhex.* t. 47.—Torr. et Gr. *Fl. N.-Amer.* i. 476.—*Bot. Mag.* t. 968.—Walp. *Rep.* ii. 126; *Ann.* iii. 869 (part).

[7] R. et Pav. *Prodr.* 60.—DC. *Prodr.* iii. 171.—Endl. *Gen.* n. 6258.—Naud. *Ann. Sc. Nat.* ser. 3, xvi. 113.—B. H. *Gen.* 763, n. 106.—Tri. *Melast.* 100.—*Cremanium* Don, *Mem. Wern. Soc.* iv. 310.—*Chitonia* Don, *loc. cit.* 317 (not Naud.).—*Diplochita* DC. *Prodr.* iii. 176.—*Hypoxanthus* Rich. (ex DC. *loc. cit.* 180).—*Chenopleura* Rich. (ex DC. *loc. cit.* 197).—*Cyatanthera* Pohl, *Pl. Bras. Icon.* ii. 130, t. 188.—*Hartigia* Miq. *Linnæa*, xviii. 284, t. 7 (not Naud.).—*Decaraphe* Steud. *Flora* (1844), 722.—*Glossocentron* Crueg. *Linnæa*, xx. 111.—*Pogonorhynchus* Crueg. *loc. cit.* 107.—*Jucunda* Cham. *Linnæa*, ix. 456 (not Benth.)—*Chiloporus* Naud. *loc. cit.* iv. 57.—*Cyanophyllum* Naud. *loc. cit.* xvii. 324.—*Octomeris* Naud. *loc. cit.* xvii. 378 (part).—*Schizanthera* Turcz. *Bull. Mosc.* (1862) ii. 322.—*Augustinea* A. S.-H. et Naud. *Ann. Sc. Nat.*

lageniform and constricted above (*Charianthus* [1]), costate or vertically alate (*Pterocladon* [2]), more rarely tubular or obconical above germen and more or less glandular within (*Chitonia* [3]). Calyx rarely closed (*Laceraria* [4]), opening irregularly, or calyptriform and circumcissus at base (*Conostegia* [5]); sepals sometimes free, sometimes connate below; lobes membranous externally bare or furnished with accessory appendages (*Pachyanthus*,[6] *Tschudya* [7]). Petals 4–8, various in form, either pointed (*Tschudya*, *Platycentrum*,[8] *Leandra*,[9] *Calycogonium* [10]), or oftener obtuse, patent or reflexed (*Eumiconia*), sometimes ovately apiculate (*Pleiochiton* [11]), free or approximate in a spuriously campanulate corolla (*Charianthus*). Stamens rarely equal in number to petals,[12] generally 8–10–16, very rarely ∞,[13] equal or slightly unequal; anthers various in form, sometimes subulate (*Tetrazygia* [14]), at apex 1- or 2–4-porous (*Cremanium*); pores small or large; more rarely 1, 2-rimose;

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ser. 3, ii. 145.—*Eurychænia* Griseb. *Fl. Brit. W.-Ind.* 258.—*Pleurochænia* Griseb. *loc. cit.* 260.—*Catachænia* Griseb. *Erl. Pfl. Trop. Am.* 54.—*Jucunda* Benth. *Hook. Journ. Bot.* ii. 302 (not Cham.).—*Tamonea* Aubl. *Guian.* i. 441 ex B. H. *Gen.* 764, not in our copy. *Fothergilla* Aubl. t. 175, the same plant, but the name wanting priority disused.

[1] Don, *Mem. Wern. Soc.* iv. 327.—DC. *Prodr.* iii. 196.—Endl. *Gen.* n. 6263.—Naud. *loc. cit.* xviii. 111 (part).—B. H. *Gen.* 762, n. 103.—Tri. *Melast.* 99 (Stamens far exserted, not or scarcely appendiculate).

[2] Hook. f. *Gen.* 763, n. 104.—Tri. *Melast.* 97 (Wings alternating with sepals; stigma discoid orbicular. Mouth of receptacle crenulate).

[3] Don, *M. Wern. Soc.* iv. 317 (not Naud.).

[4] Tri. *loc. cit.* 101.

[5] Don, *M. Wern. Soc.* iv. 316.—DC. *Prodr.* iii. 173.—Endl. *Gen.* n. 6248.—B. H. *Gen.* 763, n. 105.—Tri. *Melast.* 97 (Stamens sometimes 15–25, exappendiculate; apex of germen produced around base of style in a sheathlike cone, a sect. not generically separable from *Laceraria*).

[6] A. Rich. *Fl. Cub.* i. 559.—B. H. *Gen.* 762, n. 101.—Tri. *Melast.* 97.—*Sarcomeris* Naud. *loc. cit.* xv. 340; xvi. t. 25.—*Chalybea* Naud. *loc. cit.* xvi. 99; xviii. t. 3 (not separable from the legitimate *Miconias*, *M. Wrightii* and others intervening. Germen and receptacle sometimes nearly of *Blakea*).

[7] DC. *Prodr.* iii. 155 (not Griseb.).—*Oxymeris* DC. *loc. cit.* 190.—Endl. *Gen.* n. 6259.—Naud *loc cit.* xvii. 346.—B. H. *Gen.* 761, n. 99.—Tri. *Melast.* 90.—*Clidemiastrum* Naud. *loc. cit.* xviii. 87, t. 4 (Of this sect., distinct only by acute petals, appears *Ossæa euphorbioides* Tri.).

[8] Naud, *loc. cit.* xviii. 114, t. 5.—B. H. *Gen.* 760, n. 97.—Tri. *Melast.* 89 (Petals nearly of *Tschudya* DC.; dorsal appendage of sinuate anthers larger).

[9] Radd. *Att. Soc. Ital. Scienz.* xviii. 6.—Naud. *loc. cit.* xviii. 88.—B. H. *Gen.* 760, n. 98.—Tri. *Melast.* 89 (Very near *Tschudya*, cymes more contracted and involucrate with lateral bracts).

[10] DC. *Prodr.* iii. 168.—Endl. *Gen.* n. 6241.—B. H. *Gen.* 761, n. 100.—Tri. *Melast.* 96 (Petals obtuse or acute. Flowers solitary or cymose 3-∞. Sect. notwithstanding habit, closely allied to *Pachyanthus*, *P. angustifolius*, &c. intervening. Sepals often as in *Tetrazygia*, longer externally 1-aculeate).

[11] Naud. *A. Gray Un. St. Expl. Exp. Bot.* i. 583, t. 73.—B. H. *Gen.* 764, n. 107.—Tri. *Melast.* 96 (Flowers 4-merous; sepals with as many accessory teeth. Flowers capitate, 3-nate, involucrate with bracts. Sect. apparently connecting *Eumiconia* with *Leandra*).

[12] In 2 or 3 species.

[13] In *M. depauperata* Gaudich. stamens are indicated 20–25.

[14] Rich. *DC. Prodr.* iii. 172.—Endl. *Gen.* n. 6244.—B. H. *Gen.* 762, n. 102.—Tri. *Melast.* 100.—*Naudinia* A. Rich. *Fl. Cub.* i. 561, t. 44 *bis* (not Dcne. not Pl.).—*Harrera* Macf. *Fl. Jam.* ii. 60 (ex B. H.).—*Chitonia* Naud. *loc. cit.* xv. 339; xvi. t. 25 (not Don).—*Miconiastrum* Naud. *loc. cit.* xv. 341; xvi. t. 25 (Receptacle constricted beyond germen. Calyx dilated, 4, 5-lobed. It differs from all sections by corymbiform cymes).

connective (sometimes thick) at base often elongate or simple, exappendiculate (*Charianthus*), anteriorly variously appendiculate, posteriorly bare or appendiculate (*Platycentrum*). Germen more or less sometimes quite (*Conostegia*, *Charianthus*) adnate to receptacle, sometimes by means of more or less complete septa continuous with it between inflexed anthers, at vertex convex or more rarely concave (*Calycogonium*), glabrous, setose or hirsute, at apex dentate, rather flat or tubular; style erect, oftener slender, at apex capitate or discoid stigmatose; cells 2–6, oftener ∞-ovulate; ovules rarely few or 2, 3. Fruit baccate, coriaceous or fleshy, finally opening irregularly (not valvately dehiscent); seeds obovoid, obcuneate or obpyramidal, rarely curved or subcochleate.—Trees or shrubs, erect or climbing, glabrous or with various indumentum; leaves sessile or generally petiolate, entire, dentate or serrate; flowers [1] in terminal or more rarely lateral or axillary racemes, more or less compound ramose, sometimes sparsely divided, glomerulate, cymose or 1–3-nate (*Pachyanthus*), sessile or oftener pedicellate, sometimes by abortion 1-lateral, 1-seriate. (*Both trop. Americas.*[2])

33? **Anæctocalyx** Tri.[3]—Flowers nearly of *Miconia*, rather large; receptacle subcampanulate. Sepals 5, 6, unequal, elongate, subulate. Petals 5, 6, obtuse, contorted. Stamens 12. Germen free, 5, 6-celled and other characters of *Miconia*. Fruit . . .?—A hirsute or for the most part ferruginous-sericeous shrub; leaves oblong petiolate, denticulate, 5–7-nerved, hairy beneath; flowers [4] collected in short capituliform spikes; sericeous bracts rather longer than flowers, connivent in involucre, imbricate.[5] (*Venezuela.*[6])

34? **Catocoryne** Hook. f.[7]—"Flowers 5-merous; receptacle

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[1] Rather large, moderate or very small, red, pink, white or yellow.

[2] Spec. about 30. Aubl. *Guian.* t. 170 (*Melastoma*).—B. *Melast.* t. 1, 6–10, 12–15, 18, 19, 20–24, 31–34, 41, 42, 44, 46, 48, 51, 54, 57.—Rich. *Act. Soc. Hist. Nat. Par.* 109.—Mart. *Nov. Gen. et Sp.* iii. t. 276 (*Graffenrieda*), 282 (*Clidemia*), 283 (*Leandra*), 285 (*Oxymeris*).—Benth. *Sulph.* t. 34 (*Clidemia*).—Hook. *Kew Journ.* i. t. 12 (*Tetrazygia*); *Bot. Mag.* t. 4383 (*Tetrazygia*).—A. Rich. *Fl. Cub.* t. 44 (*Calycogonium*).—Griseb. *Fl. Brit. W.-Ind.* 249 (*Clidemia*), 250 (*Tschudya*), 261 (*Cremanium*), 263 (*Charianthus*); *Pl. Wright. Cub.* 183.—Walp. *Rep.* ii. 137 (*Leandra*), 140 (*Jucunda*), 146, 147 (*Oxymeris*), v. 698 (*Augustinea*), 706 (*Octomeris*), 715, 718 (*Decaraphe*), 722 (*Oxymeris*, *Cremanium*, *Hartigia*); *Ann.* ii. 609; iii. 888 (*Chitonia*), 889 (*Sarcomeris*, *Tetrazygia*); iv. 695 (*Calycogonium*), 700 (*Chalybea*), 702 (*Conostegia*), 705, 751 (*Cyanophyllum*), 770 (*Octomeris*), 773 (*Leandra*, *Tschudya*), 780 (*Charianthus*).

[3] Ex B. H. *Gen.* 765, n. 111; *Melast.* 97.

[4] "White."

[5] Gen. hence very near *Tococa*, thence to *Miconia*, differing from both chiefly in bracteate capitules and unequal sepals.

[6] Spec. 1. *A. bracteosa* Tri. *loc. cit.*—*Octomeris bracteosa* Naud. *Ann. Sc. Nat.* ser. 3, xvii. 379.

[7] *Gen.* 765, n. 109.—Tri. *Melast.* 134.

widely turbinate. Sepals 5, shorter, 3-angular. Stamens 10; anthers oblong, 1-porous, connective not produced at base much thickened and posteriorly broadly appendiculate. Germen semiadherent to receptacle, ∞-ovulate. Fruit . . . ?—A hispid-pilose herb;[1] stems slender creeping; leaves ovately rotund (rather small), apiculate, 3–5-nerved; flowers[2] long-pedunculate terminal or inserted in dichotomy of branches; peduncle minute 2-bracteolate[3] to middle." (*Peru.*[4])

35. **Tococa** AUBL.[5]—Flowers 5, 6-merous; receptacle campanulate, sometimes costate. Calyx membranous; lobes 5, 6, short or acute, externally bare or furnished with a more or less elongate tooth. Petals 5, 6, oblong or obtuse, contorted. Stamens 10–12, inserted with perianth at dilated mouth of receptacle, 2-seriate, scarcely unequal; filaments much incurved; anthers pointed, 1-porous at apex; connective oftener posteriorly tubercular or shortly spurred at base. Germen to middle adnate to receptacle, free above, at apex crowned with hairs or a ring; style rather thick erect, at apex stigmatose depressedly capitate. Fruit baccate; seeds straight, pyramidal or obovoid, glabrous or wrinkled; raphe lateral slightly prominent.—Glabrous or hispid shrubs; leaves large petiolate, entire or dentate, 5-nerved; petiole often inflated at base to 2-plex vesicle; cushions sometimes setose; flowers[6] in compound cymiferous terminal or lateral racemes, sometimes widely bracteate.[7] (*Trop. east. S. America.*[8])

36. **Maieta** AUBL.[9]—Flowers 4–8-merous (nearly of *Tococa*); receptacle externally glabrous, sometimes oftener setose ramosely aculeate (*Calophysa*[10]) or furnished externally with dentate wings (*Microphysca*[11]). Calyx sometimes (*Myriaspora*[12]) dehiscent, oftener 4–6-merous; with

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[1] "In appearance like *Anagallis*."

[2] "For the plant large."

[3] A plant unknown to us, described as "in habit very like *Heeria procumbens* NAUD. but, differing in the character of the flower and the fruit being unknown, of doubtful place in the system."

[4] Spec. 1. *C. linnæoides* HOOK. F. *loc. cit.*

[5] *Guian.* i. 437, t. 174.—J. *Gen.* 330.—DC. *Prodr.* iii. 165.—ENDL. *Gen.* n. 6232.—NAUD. *Ann. Sc. Nat.* ser. 3, xvi. 88; xviii. t. 3.—B. H. *Gen.* 764, n. 108.—TRI. *Melast.* 131.—*Sphærogyne* NAUD. *loc. cit.* xv. 331; xvi. t. 24.

[6] Rather large, white or pink.

[7] "A genus distinct in habit rather than in character from the sect. *Diplochita* of *Miconia*" (B. H.).

[8] Spec. about 25. MART. *Nov. Gen. et Sp.* iii. t. 277, 278.—BENTH. *Hook. Journ. Bot.* ii. 303, 313 (*Miconia*).—WALP. *Rep.* ii. 141; v. 711; *Ann.* iv. 696.

[9] *Guian.* i. 443, t. 176.—J. *Gen.* 330.—DC. *Prodr.* iii. 166.—ENDL. *Gen.* n. 6234.—NAUD. *Ann. Sc. Nat.* ser. 3, xvi. 97.—B. H. *Gen.* 767, n. 116.—TRI. *Melast.* 141.—H. BN. *Adansonia* xii. 90.

[10] DC. *Prodr.* iii. 166.—ENDL. *Gen.* n. 6235.—NAUD. *loc. cit.* xvi. 98.—B. H. *Gen.* 766, n. 114.—TRI. *Melast.* 140.

[11] NAUD. *loc. cit.* xvi. 99; xviii. t. 3 (*Microphysa*).—B. H. *Gen.* 767, n. 117.—TRI. *Melast.* 141.

[12] DC. *Prodr.* iii. 165.—ENDL. *Gen.* n. 6231.—NAUD. *loc. cit.* xvi. 100; xviii. t. 3.—B. H. *Gen.* 769, n. 123.—TRI. *Melast.* 145.

as many short or long-subulate (*Myrmidone*[1]) teeth interposed. Petals various. Stamens 8–10 (nearly of *Tococa*). Germen generally quite adnate inferior, sometimes depressed at apex, more rarely free in part (*Sagræa*[2]); style, &c. of *Tococa*.—Shrubs or undershrubs, more rarely herbs; leaves with a basilar vesicle (*Calophysa*, *Eumaieta*, *Myrmidone*, *Microphysca*) or without (*Sagræa*, *Clidemia*,[3] *Heterotrichum*[4]); flowers generally lateral or axillary, rarely terminal (*Clidemia*, *Heterotrichum*), collected in cymes, sometimes in more or less compound, sometimes in contracted and subcapituliform racemes. (*Both trop. Americas.*[5])

37. **Henriettea** DC.[6]—Flowers 5- or more rarely 4–6-merous; receptacle campanulate, oftener externally setose. Calyx more or less dilated, subtruncate or dentate or lobed. Petals pointed or obtuse, sometimes coherent. Stamens 8–12, 2-seriate, subequal; anthers linear-oblong, straight or incurved, or short obtuse recurved (*Henriettella*[7]); connective not produced, inappendiculate or with short dorsal spur. Germen 4–6-celled, quite adnate to receptacle or nearly so; style truncate or capitellate at apex.—Trees or shrubs, glabrous or with various indumentum; leaves coriaceous, entire or denticulate, 3–5-nerved; flowers[8] in ramose cymes or glomerules springing from under leaves. (*Trop. America.*[9])

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[1] Mart. *Nov. Gen. et Sp.* iii. 149, t. 279.—Endl. *Gen.* n. 6233.—B. H. *Gen.* 767, n. 118.—Tri. *Melast.* 141.

[2] DC. *Prodr.* iii. 170 (not Naud.).—Endl. *Gen.* n. 6243.—B. H. *Gen.* 766, n. 113.—Tri. *Melast.* 137.—*Staphydiastrum* Naud. *loc. cit.* xvii. 325 (Hence not separable from *Clidemia*, thence from *Maieta*).

[3] Don, *Mem. Wern. Soc.* iv. 306.—DC. *Prodr.* iii. 155 (part).—Endl. *Gen.* n. 6229.—B. H. *Gen.* 766, n. 112.—Tri. *Melast.* 134.—*Staphidium* Naud. *loc. cit.* xvii. 305 (part).—*Stephanotrichum* (Naud. *loc. cit.* iv. 54 (Petals very various, either linear or obtuse or sometimes retuse).

[4] DC. *Prodr.* iii. 173.—Endl. *Gen.* n. 6245.—Naud. *loc. cit.* xviii. 85.—B. H. *Gen.* 765, n. 110.—Tri. *Melast.* 134.—*Octomeris* Naud. *loc. cit.* xvii. 378.—*Diplodonta* Karst. *Linnæa*, xxviii. 439 (Germen often depressed at apex; tube of receptacle sometimes clothed above with a thin disk).

[5] Spec. about 75. Aubl. *Guian.* t. 167 (*Melastoma*).—B. *Melast.* t. 3, 4, 39, 44.—Mart. *Nov. Gen. et Sp.* iii. t. 280, 281 (*Sagræa*).—Miq. *Comm. Bot.* t. 11 B.—Griseb. *Fl. Brit. W.-Ind.* 246 (*Clidemia*, part).—*Bot. Mag.* t. 1971 (*Melastoma*), 4421 (*Heterotrichum*).—Walp. *Rep.* ii. 138 (*Clidemia*) 141 (*Myrmidone*), 142; v. 706 (*Octomeris*, part), 709 (*Clidemia*), 710 (*Myriaspora*), 711, 717 (*Sagræa*), 720 (*Stephanotrichum*); *Ann.* ii. 603 (*Clidemia*), 607 (*Heterotrichum*); iv. 699, 700 (*Microphysa*), 701 (*Myriaspora*), 745 (*Staphidium*), 751 (*Staphidiastrum*), 755 (*Clidemia*), 770 (*Octomeris*, part), 771 (*Heterotrichum*), 774 (*Sagræa*).

[6] *Prodr.* iii. 178.—Endl. *Gen.* n. 6252.—Naud. *Ann. Sc. Nat.* ser. 3, iv. 56; xviii. 104.—B. H. *Gen.* 768, n. 122.—Tri. *Melast.* 144.—*Phyllopus* Mart. *Nov. Gen. et Sp.* iii. 143, t. 275.

[7] Naud. *loc. cit.* xviii. 107.—B. H. *Gen.* 769, n. 124.—Tri. *Melast.* 143.—*Aphanodon* Naud. *loc. cit.* xviii. 110 (Petals often pointed, but sometimes, as in the legitimate *Henriettæ*, obtuse).

[8] Small or rather large, white or pink.

[9] Spec. about 20. Aubl. *Guian.* t. 162 (*Melastoma*).—P. Br. *Jam.* t. 24, fig. 1, 2 (*Melastoma*).—Vahl, *Ecl.* iii. t. 23 (*Melastoma*), 48 (*Mela-*

38. **Ossæa** DC.[1]—Flowers nearly of *Henriettea;* receptacle tubular or campanulate, dilated above to a truncate or lobed calyx, externally costate or furnished with subulate accessory appendages (*Octopleura*[2]). Petals 4, 5, generally acute or acuminate, sometimes coherent in a cone, contorted. Stamens 8–10, 2-seriate, subequal; anthers generally curved, connective not or scarcely produced at base, very rarely with obtuse posterior spur. Germen for a large part adnate to receptacle, enlarged or intruded at apex, 4, 5-celled; style generally slender. Fruit baccate, often globular, sometimes 8–10-costate; seeds subglobular, obovoid or obpyramidal; raphe lateral hollowed.—Shrubs or undershrubs; leaves membranous, 3–7-nerved, entire or denticulate; flowers[3] in axillary or rarely terminal, sometimes 1-lateral scorpioid (*Diclemia*[4]) cymes, bracteate or ebracteate. (*Both trop. Americas.*[5])

39? **Mecranium** Hook. f.[6]—Flowers nearly of *Ossea*, 4, 5-merous; receptacle obovoid or hemispherical glabrous. Sepals obtuse. Petals obtuse or retuse; sometimes terminated at apex with a hair. Stamens 8–10, subequal; anthers short, dehiscing by 1, 2 pores; connective not produced at base, articulated at top of filament not appendiculate. Germen adnate to receptacle inferior, 3–5-celled, subplane at vertex, slightly prominent or sulcate; style generally rather short, at apex stigmatose truncate or capitellate. Fruit small baccate; seeds oblong, dimidiately obovoid, sometimes curved or subcochleate.—Glabrous shrubs or small trees; branches terete or sometimes sub-4-gonal; leaves petiolate, entire or crenate, 3-nerved; flowers[7] in axillary or infra-axillary ramosely compound racemes; pedicels minutely bracteolate.[8] (*Antilles.*[9])

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stoma).—Seem. *Her.* 124 (*Sagræa*).—Griseb. *Fl. Brit. W.-Ind.* 245 (*Loreya*).—Walp. *Rep.* ii. 145; v. 716; *Ann.* ii. 609; iv. 777, 778 (*Henriettella*), 809.

[1] *Prodr.* iii. 168 (not Naud.).—Endl. *Gen.* n. 6242.—B. H. *Gen.* 770, n. 126.—Tri. *Melast.* 146.—*Sagræa* Naud. *Ann. Sc. Nat.* ser. 3, xviii. 92 (not DC.).

[2] Griseb. *Fl. Brit. W.-Ind.* 260.—B. H. *Gen.* 769, n. 125.—Tri. *Melast.* 145.

[3] Small or very small.

[4] Naud. *loc. cit.* xviii. 102.

[5] Spec. about 45. B. *Melast.* t. 38, 59 (*Melastoma*).—Benth. *Sulph.* 94 (*Clidemia*).—Griseb. *Fl. Brit. W.-Ind.* 248 (*Clidemia*), 265 (*Davya*); *Cat. Pl. Cub.* 95 (*Calycogonium, Sagræa*).—Walp. *Rep.* ii. 142; *Ann.* iv. 754.

[6] *Gen.* 767, n. 115.—Tri. *Melast.* 139.

[7] Small or very small.

[8] Gen. hence very near *Cremanium* and *Ossea;* differing from *Clidemia* by its anthers, thence closely allied to *Loreya* among the *Blakeeæ*.

[9] Spec. 5, 6. B. *Melast.* t. 36, 37.—Sw. *Fl. Ind. Occ.* 804, 816 (*Melastoma*).—Naud. *Ann. Sc. Nat.* ser. 3, xvii. 335–337 (*Ossæa*).—Desrx. *Lamk. Dict.* iv. 35 (*Melastoma*).—Macf. *Fl. Jam.* ii. 49 (*Ossæa*).—Griseb. *Fl. Brit. W.-Ind.* 261 (*Cremanium*); *Cat. Pl. Cub.* 102 (*Cremanium*).

40. **Meriania** Sw.[1]—Flowers 5-merous;[2] receptacle hemispherical, cyathiform or campanulate; calyx entire or 5-lobed, accessory teeth sometimes 5, free or more or less adnate. Petals oblong or obovate, connivent in spuriously campanulate corolla, free. Stamens 10; connective not produced, furnished posteriorly with a simple or spurred (*Eumeriania*) appendage, sometimes erect, parallel to anther (*Adelobotrys*[3]), or thick conical enlarged (*Axinæa*[4]). Germen 3–5-celled, free; style slender or rather thick (*Axinæa*), at apex stigmatose truncate or punctiform. Capsule 3–5-valved; seeds cuneate, clavate, pyramidal or linear.—Trees or shrubs, sometimes climbing (*Adelobotrys*); leaves petiolate, ovate or oblong, entire or serrate, 3–5-nerved; flowers[5] in terminal or lateral more or less ramosely cymiferous racemes. (*Trop. America.*[6])

41. **Huberia** DC.[7]—Flowers 4-merous; receptacle urceolate, narrowed to neck, sometimes costate alate. Sepals 4, rather broad. Petals 4, longer than calyx, much contorted. Stamens 8, the oppositipetalous scarcely shorter; anthers incurved elongate; cells undulate within; connective not produced below anthers, furnished externally at base with subulate appendage. Germen free except quite at base, 4-celled; style slender, at apex stigmatose not dilated. Capsule enclosed by indurate receptacle, 4-valved. Seeds ∞, sometimes imbricate, produced on both sides to an elongate wing, or more rarely exalate (*Opisthocentra*).—Glabrous or viscose shrubs; leaves opposite petiolate, entire or serrate, coriaceous penninerved; flowers[8] generally in 3-flowered cymes, long-stipitate. (*Brazil.*[9])

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[1] *Fl. Ind. Occ.* ii. 823, t. 15.—DC. *Prodr.* iii. 100.—Endl. *Gen.* n. 6169.—Naud. *Ann. Sc. Nat.* ser. 3, xviii. 124, t. 5.—B. H. *Gen.* 749, n. 56.—Tri. *Melast.* 65, t. 5, fig. 55.—*Pachymeria* Benth. *Pl. Hartweg.* 130.—*Adelbertia* Meissn. *Gen.* 114; *Comm.* 81.—*Notocentrum* Naud. *loc. cit.* xviii. 131.—*Davya* Naud. *loc. cit.* xviii. 134.—*Schwerinia* Karst. *Fl. Columb.* i. 35, t. 18.

[2] Seldom *Pachymeria* 4-merous.

[3] DC. *Prodr.* iii. 127.—Endl. *Gen.* n. 6207.—B. H. *Gen.* 750, n. 57.—Tri. *Melast.* 67, t. 5, fig. 56.—*Sarmentaria* Naud. *loc. cit.* xviii. 140.

[4] R. et Pav. *Prodr.* iv. t. 409–413; *Syst.* 122.—Don, *Mem. Wern. Soc.* iv. 319.—DC. *Prodr.* iii. 101.—Endl. *Gen.* n. 6170.—Naud. *loc. cit.* xviii. 123.—B. H. *Gen.* 749, n. 55.—Tri. *Melast.* 68, t. 5, fig. 57.—*Chastenæa* DC. *Prodr.* iii. 102.—Endl. *Gen.* n. 6171.—Naud. *loc. cit.* xviii. 119.

[5] Rather large, crowded, sometimes large, showy, white, yellow, pink, red or purple.

[6] Spec. about 45. Aubl. *Guian.* t. 172 (*Melastoma*).—Sw. *Prodr.* 61 (*Rhexia*).—Desrx. *Dict.* iv. 35 (*Melastoma*).—B. *Rhex.* t. 4.—Deless. *Ic. Sel.* v. t. 2 (*Chastenæa*).—Tuss. *Fl. Ant.* t. 61.—DC. *Mém. Mélast.* 18, t. 3 (*Davya*).—Griseb. *Fl. Brit. W.-Ind.* 264 (*Davya*).—Walp. *Rep.* ii. 117; v. 676, 677 (*Chastenæa*); *Ann.* iv. 783 (*Chastenæa*), 785.

[7] *Prodr.* iii. 165; *Mém. Mélast.* t. 10.—Endl. *Gen.* n. 6176.—Naud. *Ann. Sc. Nat.* ser. 3, xv. 336; xvi. t. 25.—B. H. *Gen.* 748, n. 51.—Tri. *Melast.* 65, t. 5, fig. 52.—*?Opisthocentra* Hook. f. *Gen.* 749, n. 54.—Tri. *Melast.* 65.

[8] White or red, rather large.

[9] Spec. 3. Presl. *Symb.* i. 58, t. 37.—Mart. *Nov. Gen. et Sp.* iii. 146, t. 276.—Walp. *Rep.* ii. 118; *Ann.* iii. 887.

42. **Behuria** Cham.[1]—Flowers 5, 6-merous (nearly of *Huberia*); sepals much larger foliaceous oblong serrulate. Petals 5, 6, obovate, much contorted. Stamens 10–12 (of *Huberia*); with a thin straight or curved dorsal appendage. Germen free except quite at base, surrounded at vertex with a shortly lobed annular corona. Fruit capsular, clothed to middle with receptacle, 5, 6-valved; seeds . . . ? —A glabrous shrub; leaves opposite petiolate, oblong-lanceolate, entire, 3–5-nerved; flowers in few-flowered foliaceous cymes (?), 2-bracteolate. (*South. Brazil.*[2])

43 ? **Pachyloma** DC.[3]—Flowers 4-merous (nearly of *Huberia*); receptacle turbinato-campanulate, produced beyond semiadnate germen. Calyx large truncate, setoso-4-denticulate. Petals obovate, much contorted. Stamens 8, 2-morphous, the larger alternipetalous; anthers in bud much incurved subulate compressed; connective produced, furnished laterally with 2 linear subulate auricles;[4] connective of smaller oppositipetalous not produced; anthers at base thickly and shortly 2-auriculate. Germen 4-celled; style slender exserted, at apex stigmatose punctiform. Capsule enclosed by receptacle, 4-valved; seeds curved or cochleate rugulose.—A glabrous shrub; leaves opposite or ternate, entire, 5-nerved; flowers in terminal ramosely 3-chotomous cymes. (*North. Brazil.*[5])

44 ? **Acanthella** Hook. f.[6]—Flowers 4-merous; receptacle subcampanulate. Sepals[7] lanceolate, persistent. Petals 4, contorted. Stamens 8, subequal; filaments elongate; anthers linear curved, 1-porous; connective not produced, at base 2-tuberculate within. Germen narrow stipitate, 4-celled; style thin, at apex stigmatose not dilated. Fruit enclosed by receptacle, capsular, oblong, 4-valved; seeds[8] oblong imbricate, girt with broad pellucid membranous wing.—A ramose shrub; bark white; leaves (small) rosulate at top of twigs

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[1] *Linnæa*, ix. 376.—Naud. *Ann. Sc. Nat.* ser. 3, xv. 338.—B. H. *Gen.* 748, n. 52.—Tri. *Melast.* 65, t. 5, fig. 51.

[2] Spec. 1. *B. insignis* Cham. *loc. cit.*

[3] *Prodr.* iii. 122.—Naud. *Ann. Sc. Nat.* ser. 3, xiii. 302.—Tri. *Melast.* 64, t. 5, fig. 50.—*Urodesmium* Naud. *loc. cit.* xv. 338; xvi. t. 25.—B. H. *Gen.* 748, n. 50.

[4] Connective said to be long-spurred posteriorly, a character certainly not constant in the specimen seen by us.

[5] Spec. 2. Mart. *Nov. Gen. et Sp.* iii. 140, t. 273 (*Heteronoma*).—Naud. *Ann. Sc. Nat.* ser. 3, xiii. 302 (*Rhexia*).

[6] *Gen.* 748, n. 53.—Tri. *Melast.* 65, t. 5, fig. 54.

[7] According to Hook. "lanceolate, setose at apex," but sometimes shorter; the incorrect fig. of Decaisne (*Oliv.* tab. fig. A) is taken from Triana, and misrepresented; the lobes of the calyx being almost entirely suppressed (Cfr. H. Bn. *Nouv. Obs. Oliv.* 29 tab. fig. BB[1].)

[8] Rather large, compressed.

acute, setulose at apex, entire glabrous, 3-nerved; flowers[1] axillary solitary; peduncle short, 2-bracteolate; bracteoles setulose at apex. (*North Brazil.*[2])

45. **Centronia** Don.[3]—Flowers 5–7-merous; receptacle saclike or hemispherical, externally with calyx hirsute or scaly. Calyx calyptrately deciduous. Petals 5–7, contorted, sometimes coherent. Stamens 10–12; filaments curved subulate; anthers elongate, sinuate within, at apex attenuate 1-porous; connective thickened to conical mass (ascending in the bud). Germen ovoid 3–7-celled; cells produced above and there sometimes 2-lobed; style erect, at apex stigmatose obtuse.[4] Fruit capsular, 3–7-valved; seeds straight pyramidal. —Glabrous or ferrugineous tomentose or scaly trees; leaves broad petiolate, entire or dentate, 3–5-nerved, sometimes subpenninerved;[5] flowers[6] in large terminal compound racemes. (*Both trop. Americas.*[7])

46. **Graffenrieda** DC.[8]—Flowers 4, 5-merous or more rarely (*Calyptrella*[9]) 5–9-merous, smaller; receptacle subcampanulate. Calyx calyptriform or opening irregularly; lobes sometimes dorsally tuberculate. Petals 4–9, obovate or oblong acuminate, more or less coherent. Stamens[10] 8–12, or rarely 14–18; anthers linear-subulate; connective not or scarcely produced, at base internally inappendiculate, posteriorly spurred. Germen subfree, 2–5-celled; style slender, at apex stigmatose truncate. Capsule 2–5-valved; seeds linear, pyramidal or (*Calyptrella*) sharp pointed.—Trees or shrubs, glabrous or pulverulent; leaves (often large) long-petiolate, ovate, oblong or orbicular, 3–9-nerved; flowers[11] in terminal or axillary sometimes brachiate or ramose cymiferous racemes. (*Both trop. Americas.*[12])

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[1] "Golden."

[2] Spec. 1. *A. Sprucei* Hook. f. *loc. cit.*

[3] *Mem. Wern. Soc.* iv. 314 (not Bl.).—DC. *Prodr.* iii. 106.—B. H. *Gen.* 750, n. 58.—Tri. *Melast.* 71, t. 5, fig. 59.—*Brachycentrum* Meissn. *Gen.* 114; *Comm.* 81.—*Calyptraria* Naud. *Ann. Sc. Nat.* ser. 3, xviii. 132.—*Sclerosarcus* (*Davyæ* sect.) Naud. *loc. cit.* xviii. 138.—*Stephanogastra* Karst. et Tri. *Linnæa*, xviii. 425.

[4] In bud internally coadunate with top of petals.

[5] "In one species, from marginal nerves and strong nervules, as if penninerved."

[6] Large, purple.

[7] Spec. 10. B. *Rhex.* t. 34; *Melast.* 136, t. 38.

[8] *Prodr.* iii. 105 (not Mart.).—Endl. *Gen.* n. 6175.—Naud. *Ann. Sc. Nat.* ser. 3, xviii. 116, t. 5.—B. H. *Gen.* 750, n. 59 (*Graffenriedia*).—Tri. *Melast.* t. 5, fig. 58.—*Cynopodium* Naud. *loc. cit.* 118.

[9] Naud. *loc. cit.* xviii. 132.—B. H. *Gen.* 751, n. 60.—Tri. *Melast.* 72, t. 5, fig. 60.

[10] Sometimes quite of *Centronia.*

[11] Small or very small, white, yellow, pink or purple.

[12] Spec. about 20. R. et Pav. *Syst.* i. 106 (*Miconia*).—B. *Rhex.* t. 25.- Deless. *Ic. Sel.* v. t. 3

II. ASTRONIEÆ.

47. **Astronia** Bl.—Flowers hermaphrodite; receptacle more or less campanulate rather thick enclosing adnate germen and produced beyond to a cupule sparsely glandular within. Calyx inserted at margin, conical, calyptriform or oftener lobed or opening unequally. Petals 4, 5, inserted with calyx, obtuse, contorted. Stamens 8–12, inserted with perianth; filaments short rather thick compressed, incurved in bud; anthers shortly or rather widely dolabriform; connective thick compressed, at base shortly or not spurred; cells introrse (in bud from inflexed anther extrorse), linear, 2-rimose. Germen inferior, 2–6-celled, adnate to receptacle and depressed or concave at apex and enclosing anthers in bud; style columnar erect, at apex more or less capitate stigmatose. Ovules in cells ∞, anatropous, narrow; placentæ affixed to internal angle, sometimes thick or oblong-conical, ascending. Fruit capsular enclosed by coriaceous finally unequally opening receptacle; nerves of receptacle ramose rigid free from parenchyma and opening stellately. Seeds ∞, ascending, linear-elongate, much narrowed on both sides; raphe excurrent; radicle of small exalbuminous fleshy embryo inferior.—Trees or shrubs, glabrous or with various indumentum; leaves opposite petiolate, entire coriaceous, 3-nerved; flowers in terminal compound ramose cymes, oftener ebracteate. (*Malaya, islands of Pacific.*)—See p. 22.

48. **Pternandra** Jack.[1]—Flowers 4-merous; receptacle hemispherical concave, externally glabrous or oftener (*Kibessia*[2]) variously setose, tuberculate or clothed with straight imbricate, simple or hooked prickles. Calyx gamophyllous, either 4-lobed, or opening unequally or calyptriform longer or shorter conical, circumcissus. Petals 4, obtuse, acute or lanceolate, contorted. Stamens 8, subequal (of *Astronia*). Germen quite inferior and adnate to receptacle, depressed

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(*Cycnopodium*).—Griseb. *Fl. Brit. W.-Ind.* 266 (*Cycnopodium*); *Enum. Fl. Cub. Wright.* 99 (*Miconia*).—Don, *Mem. Wern. Soc.* iv. 317 (*Conostegia*).—Walp. *Rep.* ii. 118; *Ann.* iv. 782.

[1] *Mal. Misc.* ii. App. 3 (1820–1822).—Hook. *Comp. Bot. Mag.* i. 158.—Naud. *Ann. Sc. Nat.* ser. 3, xviii. 260.—B. H. *Gen.* 771, n. 130.—Tri. *Melast.* 153.—Hook. *Fl. Ind.* ii. 551.—*Ewyckia* Bl. *Flora* (1831), 524; *Rumphia*, i. 24, t. 8; *Mus. Lugd.-Bat.* i. 5, fig. 1.—*Apteuxis* Griff. *Notul.* iv. 672.

[2] DC. *Prodr.* iii. 196 (1828).—Endl. *Gen.* n. 6265.—Naud. *loc. cit.* xviii. 262.—B. H. *Gen.* 771, n. 131.—Tri. *Melast.* 152.—*Rectomitra* Bl. *Mus. Lugd.-Bat.* i. 6, fig. 2.—Tri. *Melast.* 153.—Hook. *Fl. Ind.* ii. 552.—*Macroplacis* Bl. *loc. cit.* i. 7, fig. 3.

at vertex, 4-celled; placentæ subbasilar or oftener parietal, ascending, ∞-ovulate. Berry umbilicate; seeds ∞, angular or cuneate. Other characters of *Astronia*.—Glabrous shrubs or small trees; leaves petiolate or sessile, entire coriaceous, 3-nerved; flowers[1] axillary solitary or few-cymose (*Kibessia*), more rarely in compound ramose cymes; pedicels often 2-bracteolate. (*Malaya, trop. Oceania.*[2])

49? **Plethiandra** Hook. f.[3]—"Flowers 6-merous; receptacle subcampanulate. Calyx truncate, 6-denticulate. Petals 6, acuminate-lanceolate. Stamens to 30, equal; filaments short, filiform; anthers linear-oblong, subrecurved inappendiculate, introrsely 2-rimose. Germen almost quite adnate to receptacle; cells 4, ∞-ovulate; style slender, punctiform at apex. Fruit . . . ?—A glabrous ramose shrub; twigs terete thickened at nodes; leaves sessile oblong lanceolate obscurely crenate, rather fleshy; nerves 3, obscure; flowers[4] axillary, thick-pedunculate, solitary or fasciculate, ebracteate."—(*Borneo.*[5])

III. BLAKEÆ.

50. **Blakea** L.—Flowers hermaphrodite; receptacle concave subhemispherical or campanulate, enclosing germen adnate within and produced beyond to an internally glandular and often sulcate cupule. Calyx gamophyllous, often dilated, 5, 6-lobed or dentate; prefloration . . . ? Petals 5, 6, various, contorted. Stamens 10–12, inserted with perianth, subequal; filaments slender (*Topobea*), or oftener rather thick, incurved in bud; anthers subdolabriform, rather broad or narrow, often compressed, cells introrse linear, porous or shortly rimose, connective at base externally produced to an acute or obtuse spur sometimes subnil. Germen inferior, 4–6-celled, at base more or less adnate to receptacle, depressed at vertex, sometimes produced to a vertical cone; style erect simple, at apex stigmatose truncate or capitate,

[1] Oftener bluish.

[2] Spec. about 17. Deless. *Ic. Sel.* v. t. 5.—Bl. *Bijdr.* 1079 (*Melastoma*).—Korth. *Verh. Nat. Gesch.* t. 66 (*Astronia*), 67 (*Ewyckia*).—Miq. *Fl. Ind.-Bat.* i. p. i. 568 (*Ewyckia*), 569 (*Kibessia*).—Walp. *Rep.* ii. 148; v. 723 (*Kibessia*), 724 (*Ewyckia*); *Ann.* ii. 610 (*Kibessia*), 611 (*Ewyckia, Rectomitra, Macroplacis*); iv. 798 (*Macroplacis, Ewyckia*), 799 (*Rectomitra*).

[3] *Gen.* 772, n. 132.

[4] "Small."

[5] Spec. 1. *P. Motleyi* Hook. f. *loc. cit.*

sometimes shortly 4–6-lobed. Ovules in cells ∞ , generally ascending, small, anatropous, inserted on thick placentæ affixed to internal angle. Fruit fleshy or coriaceous, sometimes spongy, depressed or concave at apex, indehiscent (?). Seeds ∞ , ovoid or pyramidal; raphe rather broad; cotyledons of exalbuminous embryo fleshy.—Erect or climbing shrubs, glabrous or variously clothed; leaves opposite, sometimes unequal, entire, 3–7-nerved, crowded transverse veins, internodes sometimes dilated; flowers axillary or solitary or cymose on lateral twig; bracts 4, decussate, involucrate under each flower. (*Both trop. Americas.*)—See p. 24.

51. **Bellucia** Neck.—Flowers nearly of *Blakea*, 5–8-merous; calyx shortly dentate or 5–8-lobed, opening unequally or sometimes circumcissus. Petals 5–8, contorted. Stamens 10–16 (of *Blakea*); connective at base not or scarcely produced. Germen inferior, 8–16-celled; ovules ∞ , style, fruit, seeds, &c., of *Blakea*.—Trees or shrubs, glabrous or tomentose; leaves petiolate entire, often coriaceous, 3–5-plinerved or 5-nerved, sometimes penninerved (*Heteroneuron*), sometimes becoming black when dry (*Loreya*, *Heteroneuron*); flowers large or more rarely (*Heteroneuron*, *Loreya*) moderate or small, in lateral or axillary, sometimes intra-axillary, rarely few- or 1-flowered cymes. (*Both trop. Americas.*)—See p. 26.

52. **Mouriri** Aubl.—Flowers nearly of *Blakea* (smaller), 4- or oftener 5-merous; receptacle turbinate or subcampanulate. Calyx cupular, entire or lobed. Petals 4, 5, obovate or acute, contorted. Stamens 8–10, inserted with perianth; filaments slender, finally erect exserted; anthers subreniform or dolabrate obtuse; cells linear introrse, poricidal or shortly rimose; connective compressed, concave at back and there furnished with a cupular glandule, and externally at base with a thick and short spur. Germen adnate to bottom of receptacle, concave at apex, glandular-sulcate, 2–5-celled; style thin exserted, at apex stigmatose not dilated. Ovules in cells 2–∞ , oftener inserted collaterally on a short placenta a little above the base of the internal angle, ascending; micropyle extrorsely superior; or from disappearance of septa inserted on a short free central placenta and verticillately ascending. Berry often crowned with calyx; seeds ∞ , sometimes few ascending; cotyledons of exalbuminous embryo thick plano-convex; radicle short inferior.—Glabrous shrubs or small trees; branches terete or sub-4-gonal; leaves opposite or rarely verticillate,

entire, coriaceous, 3-nerved or subpenninerved; flowers in axillary, umbelliform or corymbiform cymes, pedicels slender, 2-bracteolate. (*Both trop. Americas.*)—See p. 27.

53. **Axinandra** Thw.—Flowers nearly of *Mouriri*, 5-merous, receptacle subcampanulate or obconical. Calyx short, 5-lobed. Petals either more or less connivent and simultaneously deciduous, contorted, or (*Naxiandra*) induplicately valvate, at apex and fimbriate margin much inflexed. Stamens 10 (of *Blakea*). Germen, &c., of *Blakea* (or *Mouriri*), 5, 6-celled. Ovules in cells 1, or oftener (*Naxiandra*) 2, collaterally ascending from bottom of internal angle; micropyle extrorsely inferior. Fruit suberose or subligneous, girt below with cupular adnate receptacle, finally loculicidal; valves thick, angular within. Seeds in cells oftener solitary, suberect; chalaza superior produced to vertical membranous wing; cotyledons of fleshy embryo plano-convex, auriculate at base. Glabrous trees; branches 4-gonal or sometimes 4-alate; wings more or less produced in spurious stipules to nodes; leaves opposite or 3-nate, entire or sinuate, penninerved or obscurely 3-nerved; flowers in axillary and terminal, simple or ramose racemes, solitary in axils of bracts, shortly pedicellate or cymose, few. (*Ceylon, Borneo.*)—See p. 27.

54. **Memecylon** L.—Flowers (of *Axinandra* or *Mouriri*) 4-merous; petals acute or obtuse, contorted. Stamens 8 (of *Mouriri*), connective furnished dorsally with 1 sessile concave glandule. Germen quite inferior and adnate to receptacle, sulcate at depressed apex, 1-celled. Ovules 6–∞, verticillate around free central placenta, ascending; micropyle extrorsely inferior. Berry globular, depressed at apex, 1-celled, oftener 1-spermous; embryo of ascending seed exalbuminous fleshy thick involute; cotyledons pointed, radicle terete inferior. Other characters of *Mouriri*.—Glabrous trees or shrubs; leaves entire coriaceous, penninerved or obscurely 3-nerved; flowers in axillary or lateral, sometimes (*Spathandra*) terminal and axillary, more or less compound ramose, subumbellate or corymbiform cymes. (*Trop. Asia, Oceania and Africa.*)—See p. 28.

LXI. CORNACEÆ.

I. CORNEL SERIES.

The Cornels[1] (fig. 46–51) have hermaphrodite regular and tetramerous flowers. The receptacle is in the form of a sac, the cavity

Cornus florida.

Fig. 46. Floriferous branch.

containing the ovary and the margin bearing the perianth and androecium. The calyx is represented by four small sepals, often

[1] *Cornus* T. *Inst.* 641, t. 410; *Cor.* 35.—L. *Gen.* n. 149.—J. *Gen.* 214.—Gærtn. *Fruct.* i. 126, t. 26.—Lamk. *Dict.* ii. 113, Suppl. ii. 355; *Ill.* t. 74.—Lhér. *Monogr. Corn.* (1788) in-fol.—

dentiform, not contiguous even in the bud. The petals are the same in number, alternate, much longer and valvate; they are generally reflexed at the time of anthesis. With them alternate four epigynous

Cornus mas.

Fig. 50. Fruit.

Fig. 47. Inflorescence.

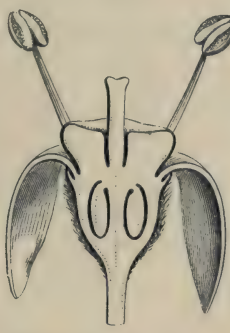

Fig. 49. Long. sect. of flower (♀).

Fig. 51. Trans. sect. of fruit.

stamens, each formed of a free filament and an introrse, bilocular anther, dehiscing by two longitudinal clefts.[1] The inferior ovary is surmounted by a style, the base of which is surrounded by an epigynous disk, often thick, entire, or more or less lobed. The stigmatiferous summit of the style is truncate or capitate, entire or nearly so. The ovary contains two, sometimes three, alternipetalous[2] cells. In the internal angle of each is a placenta supporting a descending, anatropous ovule with micropyle primarily directed upwards and inwards.[3] The fruit is a drupe, the summit of which bears the scar of the perianth. The putamen, hard and thick,[4] is of two (rarely three) cells, enclosing each a descending seed, the coats[5] covering a fleshy albumen and an axile embryo, with superior cylindrical radicle and foliaceous coty-

Cornus mas.

Fig. 48. Diagram.

DC. *Prodr.* iv. 271.—Spach, *Suit. à Buffon*, viii. 90.—Turp. *Dict. Sc. Nat.* Atl. t. 103.—Endl. *Gen.* n. 4574.—Payer, *Organog.* 418, t. 86.—B. H. *Gen.* 950, n. 5.—H. Bn. *Payer Fam. Nat.* 340.

[1] The pollen, according to H. Mohl (*Ann. Sc. Nat.* ser. 2, iii. 325), is "ovoid; 3 folds; in water, ovoid; 3 narrow bands; external membrane finely punctuated.

[2] One anterior, the other posterior.

[3] It generally undergoes a torsion which finally brings the micropyle on the side. It has a simple and very incomplete coat.

[4] Indented with very numerous and often unequal hollows filled with oil.

[5] Thin membranous and formed perhaps, according to their mode of organization, in the same manner as those of the *Umbelliferæ*.

ledons. The Cornels inhabit the temperate regions of Europe, Asia, N. America, and Peru. More than twenty species [1] are distinguished. The greater part are woody and have opposite, entire, or serrulate, penninerved leaves. There is, however, in the United States a *Cornus alternifolia*.[2] The inflorescences are cymes. Sometimes the flowers are white and pedicellate; the cyme is more or less corymbiform: it is so in *C. sanguinea*, *alba*, *paniculata*, &c., which have been united in a section *Thelycrania*.[3] Sometimes the flowers are yellow and the pedicels short; the collected inflorescence resembles an umbel, as in *C. mas* [4] (fig. 47–51). In other cases the cyme is of sessile flowers, composed of glomerules and surrounded by from four to eight coloured bracts forming a petaloid involucre, as in *C. suecica*, *canadensis*, herbaceous species,[5] and in *C. florida* (fig. 46), an arborescent species.[6] But the fruits, although very close to each other (in a false capitule), are nearly independant; whilst in *C. fragifera*, of which the genus *Benthamia* [7] has been made, the flowers of the glomerule, surrounded by an involucre, are united by their receptacular portion, and still more the fruits, which form a compound drupe, in the form of a large strawberry with areolate surface.

Corokia [8] has nearly the flower of *Cornus*, ordinarily pentamerous,[9] with the same inferior and di- or tricarpelar ovary. A small scale, often scarcely visible and laciniate above, lines the base of the petals. The ovary is surmounted by a disk and a style with two or three short and thick stigmatiferous branches. The two or three cells are incomplete at the summit, where a placentary enlargement supports, in each cell, a descending ovule, with micropyle interior and superior. The fruit is a drupe of which the putamen is 1, 2-celled.[10] Two

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[1] Michx. *Fl. Bor.-Amer.* i. 91.—Roxb. *Fl. Ind.* i. 432.—C. A. Mey. *Ann. Sc. Nat.* ser. 3, iv. 58.—Œder, *Fl. Dan.* t. 5.—Sow. *Engl. Bot.* t. 310.—Wall. *Pl. As. Rar.* t. 214.—Torr. et Gr. *Fl. N.-Amer.* i. 649.—Wight, *Ill.* t. 122.—Benth. *Fl. Hongk.* 137.—Gren. et Godr. *Fl. de Fr.* ii. 2.—*Bot. Mag.* t. 526, 880, 2675, 4641.—Walp. *Rep.* ii. 435; v. 932; *Ann.* i. 359; ii. 725; v. 90.

[2] L. f. *Suppl.* 125.—Lhér. *loc. cit.* t. 6.—Guimp. *Abb. Holz.* t. 43.—*C. alterna* Marsh.—DC. *Prodr.* n. 1.

[3] Endl. *oc. cit.* c.—*Microcarpium* Spach, *loc. cit.* 92, sect. 1.

[4] Sect. *Tanycrania* Endl. *loc. cit.* b.—*Macrocarpium* Spach, *loc. cit.* 101.

[5] Sect. *Arctocrania* Endl. *loc. cit.* a.—*Cormion* Spach, *loc. cit.* 9.

[6] Gen. *Benthamidia* Spach, *loc. cit.* 106.

[7] Lindl. *Bot. Mag.* t. 1579; *Veg. Kingd.* (1846) 782, fig. 518.—Spach, *loc. cit.* 108.—Endl. *Gen.* n. 4575.—Sieb. et Zucc. *Fl. Jap.* i. 37, t. 16.

[8] A. Cunn. *Ann. Nat. Hist.* iii. 249.—Endl. *Gen.* n. 5751.—B. H. *Gen.* 949, n. 4.—H. Bn. *Payer Fam. Nat.* 340.

[9] Sometimes hexamerous.

[10] With complete or incomplete cells.

Corokias are known, shrubs of New Zealand,[1] with alternate, persistent, small, entire and coriaceous leaves. The flowers[2] are collected in axillary or terminal clusters, more or less compound, rarely simple, and the floral pedicel bears two lateral bracteoles.

Kaliphora madagascariensis[3] is a shrub with alternate leaves, the flowers of which much resemble in their general organization those of the preceding types; but they are unisexual. In the female flower, the concave receptacle partly lodges the inferior ovary, which has two uniovulate cells.[4] In the male flower, the receptacle is small, not concave, and bears a short gamosepalous calyx with four teeth, four long alternate, valvate, or slightly imbricate petals, and four[5] alternate stamens, with bilocular and introrse anthers. The short filaments are inserted under a circular disk which surrounds the conical rudiment of a sterile gynæcium.

Helwingia japonica.

Fig. 52. Floriferous leaf of male.

Fig. 53. Long. sect. of female flower ($\frac{1}{1}$♀).

In *Helwingia*[6] (fig. 52, 53),[7] type of a sub-series (*Helwingieæ*) often referred to other families, the flowers are equally unisexual, dicœcious, 3–5-merous. In the female flowers, the inferior ovary is similar to that of *Cornus*, and each of its cells encloses a descending ovary, with micropyle interior and superior. It is surmounted by small calycinal collar in which

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[1] Hook. *Icon.* t. 424.—Raoul, *Choix de Pl. Nouv.-Zél.* t. 20.—Hook. f. *Fl. Nov.-Zel.* i. 98; *Handb. N.-Zeal. Fl.* 105.

[2] Small, yellowish.

[3] Hook. f. *Gen.* 951, n. 10; *Hook. Icon.* ser. 3, i. 16, t. 1023.

[4] We cannot, for want of material, affirm the primary direction of the micropyle, often lateral at adult age.

[5] Decaisne (*Bull. Soc. Bot. Fr.* xx. 157) has removed this genus from the *Cornaceæ* because its androecium is diplostemonous; this is an error. There are as many stamens as petals. The connective is slightly apiculate.

[6] W. *Spec. Pl.* iv. 716.—Morr. et Dcne. *Obs. Pl. Jap.* 5; *Ann. Sc. Nat.* ser. 2, vi. 68, t. 7.—Endl. *Gen.* n. 2090.—Payer, *Organog.* 429, t. 109.—J. G. Agardh, *Theor. Syst. Plant.* 310.—B. H. *Gen.* 939, n. 15.—H. Bn. *Bull. Soc. Linn. Par.* 137.—Hook. *Fl. Ind.* ii. 726.

[7] The ovule has not two coats so distinct as in the fig., a point impossible to determine precisely from dried specimens and aged ovaries, probably only one as in *Aucuba*, *Garrya*, &c.

are inserted 3–5 epigynous, valvate, afterwards reflexed petals,[1] and a style thickened at the base, and with as many stigmatiferous branches as there are cells in the ovary. In the male flower, the receptacle does not become concave, and the calycinal collar disappears completely or nearly so. The perianth has only 3–5 valvate petals,[2] with which alternate an equal number of free stamens, with incurved filament, inserted under a central, glandular, and polygonal body, and bilocular, introrse anthers, dehiscing by two longitudinal clefts. The fruit is a drupe with monospermous putamens,[3] and the seeds enclose an embryo surrounded by a smooth albumen. *Helwingia* comprises glabrous shrubs, one from the Himalaya, the other from China.[4] The leaves are alternate, penninerved, serrated, with glandular hairs often found at the base and on the sides of the petiole. The inflorescence is axillary; but, trained along the median nerve of the axillant leaf, it is disengaged about the middle of the upper surface.[5] It is in biparous and few- or even one-flowered cymes in the females, generally richer in the males.

Aucuba[6] (fig. 54–56), forming a sub-series (*Aucubeæ*) in this group, has diœcious and nearly always tetramerous flowers. In the male flowers there is a small gamosepalous calyx with four teeth and four alternate, valvate,[7] caducous petals. Four stamens alternate with the petals, inserted round a rudimentary gynæcium, having the appearance of a central, cuplike disk, with four small obtuse lobes,[8] and formed each of a free filament and a bilocular introrse anther, dehiscing by two longitudinal clefts. In the female flower, the receptacle takes the form of a deep, ovoid, or cylindrical sac, the mouth of which bears four teethlike sepals and four alternate valvate petals. The inferior ovary, lodged in the receptacular cavity, has a single cell, and is surmounted by a short and thick style, the summit of which, oblique and enlarged, is stigmatiferous, and its side has a

[1] They are greenish and have been generally considered as calicinal folioles.

[2] With a great many authors these are also sepals, the male flower being considered apetalous.

[3] Two, three or four.

[4] Thunb. *Fl. Jap.* 31; *Icon. Dec.* iii. t. 1 (*Osyris*).—Sieb. et Zucc. *Fl. Jap.* 164, t. 86.

[5] In the Indian species the limb of the leaf may be more or less completely abortive.

[6] Thunb. *Fl. Jap.* 4, t. 12, 13.—Banks, *Ic. Pl. Jap.* t. 13.—J. *Gen.* 382.—Lamk. *Ill.* t. 759.—Poir. *Dict.* Suppl. i. 537.—DC. *Prodr.* iv. 274.—Don, *Edinb. New Phil. Journ.* viii. 165.—Bl. *Fl. Jav. Loranth.* 5, not.—Spach, *Suit. à Buffon*, viii. 88.—Endl. *Gen.* n. 4575.—Payer, *Organog.* 419, t. 105.—Lindl. *Veg. Kingd.* 703.—Ag. *Theor. Syst.* 303.—H. Bn. *Payer Fam. Nat.* 340; *Adansonia*, v. 179.—B. H. *Gen.* 950, n. 7.—*Eubasis* Salisb. *Prodr.* 68.

[7] Sometimes slightly induplicate above; the summit forms in the bud a small pendant obconical key.

[8] There is sometimes a small depression in the centre, the rudiment of an ovarian cavity.

vertical furrow. The latter corresponds to the placenta, which supports a descending anatropous ovule inserted near the summit, with superior micropyle turned towards the placenta,[1] and dorsal raphe. The fruit is a berry, crowned with a scar or with the remains

Aucuba japonica.

Fig. 55. Long. sect. of female flower.

Fig. 54. Female inflorescence.

Fig. 56. Fruit.

of the calyx. The seed, descending, encloses a hard horny albumen,[2] and a small apical embryo,[3] with superior radicle and short cotyledons. The *Aucubas* are glabrous shrubs from temperate and especially eastern Asia. There are two or three species.[4] The leaves are opposite, petiolate, without stipules, coarsely serrate, penninerved, coriaceous and glossy. The flowers[5] are collected at the axil of the leaves, or at the end of the branches in ramified clusters of cymes, and are articulate at the summit of a short pedicel which bears two bracteoles below.

Griselinia[6] has very close affinities with *Aucuba*. It has the inferior ovary, ordinarily unilocular and uniovulate,[7] surmounted by four or five sepals and an equal number of imbricate petals[8] (which may be absent). The male flower, in construction like that of

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[1] The funicle, short and thick, forms a sort of obturator above it.

[2] Often a little uneven on the surface.

[3] It is often only about a third of the length of the albumen and may be eccentric. Duchartre, who however places *Aucuba* among the *Corneæ*, says (*Elém.* edit. 2, 1129) that the latter have "the embryo in the axis and nearly of the length of the fleshy albumen."

[4] About six are admitted. Hook. f. *Ill. Himal. Pl.* t. 12.—Benth. *Fl. Hongk.* 138.—Fr. et Sav. *Enum. Fl. Jap.* i. 197.—*Bot. Mag.* t. 1197, 5512.—Walp. *Rep.* ii. 436.

[5] Small, greenish, with the petals ordinarily of a brownish purple sunk within.

[6] Forst. *Prodr.* 75 (not Neck.).—Spreng. *Pugill.* t. 63.—Endl. *Gen.* n. 6886.—H. Bn. *Payer Fam. Nat.* 341; *Adansonia*, v. 184.—B. H. *Gen.* 951, n. 9.—*Scopolia* Forst. *Char. Gen.* 139, t. 70 (not L. nor Adans. nor Schreb. nor Sm.).—*Decostea* R. et Pav. *Prodr.* 130.—K. *Ann. Sc. Nat.* ser. 1, ii. 346.—Endl. *Gen.* n. 4576.—*Pukateria* Raoul, *Ann. Sc. Nat.* ser. 3, ii. 120.

[7] Sometimes it presents one or two complementary cells, ordinarily smaller and sterile, rarely fertile. In most species it is surmounted by three stylary branches. Above the ovule, the short funicle is more or less thickened, a in *Aucuba*, and often in all parts.

[8] Sometimes however nearly valvate.

Aucuba, is ordinarily pentamerous. It consists of trees or shrubs, sometimes climbing, growing in New Zealand, Chili, and on the mountains of Brazil. The leaves are alternate, without stipules,[1] glabrous, with limb generally unsymmetrical, and the flowers,[2] articulate on a pedicel, are collected in more or less ramified and compound clusters. Eight species are distinguished.[3]

Torricellea tiliæfolia,[4] a small Himalayan tree, has pentamerous[5] flowers analogous to those of the preceding genera, with a very short calyx, five valvate petals, and five alternate stamens, inserted round a rudimentary gynæcium (which may be absent) surrounded by a depressed disk. In the female flowers, the saclike receptacle bears four to six short sepals, inserted on the margin of the opening. The concavity contains an ovary most frequently trilocular, surmounted by three short and thick stylary branches, entire or bifid at the summit. The cells, or one or two of them, enclose a descending ovule, the short funicle of which is somewhat thickened above the micropyle primarily interior and superior. The fruit is a drupe with a crustaceous, plurilocular, generally monospermous putamen. The seed is descending, and the embryo, of small volume, occupies the upper portion of a fleshy embryo. *Torricellia* has alternate, petiolate, dentate, 5–7-nerved leaves, and flowers arranged in ramified groups of pendent cymes with slender axes and pedicels furnished with lateral bracteoles, articulated superiorly in the female inflorescence.

II. GARRYA SERIES.

In these plants which have by themselves constituted a distinct family, the flowers are dicœcious and generally tetramerous. The male flowers of *Garrya elliptica*[6] (fig. 57, 58), a species cultivated in

[1] The petiole, however (articulate at the base), may be dilated at the margin into two small layers resembling narrow stipules.

[2] Small, yellow or greenish.

[3] R. et Pav. *Syst.* 259 (*Decostea*).—C. Gay, *Fl. Chil.* viii. 394, t. 33 *ter* (*Decostea*).—Raoul, *Ch. de Pl. Nouv.-Zél.* t. 19.—Hook. f. *Fl. Nov.-Zel.* i. 98; *Handb. N.-Zeal. Fl.* 104.—Walp. *Ann.* iv. 432 (*Decostea*).

[4] DC. *Prodr.* iv. 257.—Endl. *Gen.* n. 4557.—Seem. *Journ. Bot.* iii. 361, t. 41.—B. H. *Gen.* 952, n. 12. Decaisne (*Bull. Soc. Bot. Fr.* xx. 159) makes it a *Haloragea*.

[5] There are some 3, 4-merous.

[6] Dougl. ex Lindl. *Bot. Reg.* t. 1686; *Ann. Sc. Nat.* ser. 2, ii. 157; *Veg. Kingd.* (1846) 295, fig. 203.—Endl. *Gen.* n. 1900.—Payer, *Fam. Nat.* 124.—B. H. *Gen.* 951, n. 8.—H. Bn. *Bull. Soc. Linn. Par.* 139; *Compt. Rend. Assoc. Franç.* (1877) c. tab.

our gardens and the longest known, is easily studied. The receptacle has the form of a small reversed cone. Around its base is a small calycinal[1] collar, very little developed and divided into four hard perceptible teeth, of which two are lateral, one anterior and one posterior. With these teeth alternate an equal number of valvate petals, much more developed, furnished with hairs above and without. The Andrœcium is composed of four alternipetalous stamens, each formed of a filament and a basi-fixed, bilocular, introrse anther dehiscing by two longitudinal clefts. In the centre of the flower is a rudimentary gynæcium, composed of two very small carpellary leaves, sterile and lateral. In the female flower, the floral receptacle is hollowed to a sac and lodges in its cavity an adnate ovary, surmounted by a style also divided into as many erect or reflexed stigmatiferous branches as there are carpels in the gynæcium, that is most frequently two,[2] which are lateral, and more rarely three. With the carpels alternate in equal number parietal placentæ, more or less prominent, one anterior, the other posterior, when the number is two. In each is inserted a descending anatropous ovule, with micropyle directed upwards and outwards,[3] and hooded with a thick obturator forming the dilated funicle above it. The female perianth is absent as we shall find in the species (fig. 59) forming the genus *Fadyenia*.[4] In the others

Garrya elliptica.

Fig. 57. Portion of male catkin.

Fig. 58. Cymes of male flowers and axillant bracts.

Garrya Fadyeni.

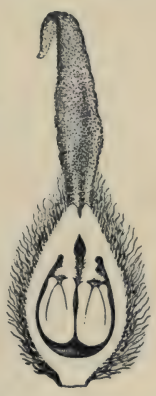

Fig. 59. Long. sect. of female flower ($\frac{5}{1}$).

[1] Considered as a simple thickening of the receptacle by those who call sepals the folioles here described as those of the corolla. The latter in the bud are covered with long hairs, especially above and outside.

[2] Rarely 3 or even 4, chiefly in the terminal flower which may be abnormal in cultivated plants.

[3] Its coat is simple and very incomplete, as is that of several Cornels.

[4] Endl. *Gen.* Suppl. ii. 30.

constituting the section *Eugarrya*, the receptacle may bear exteriorly or near the margin, two lateral folioles of uncertain nature,[1] which may be very little developed or even disappear. The fruit is a berry, little fleshy, surmounted by the style or its scar; it contains one or two descending seeds, the coats[2] of which cover a fleshy albumen, lodging in its upper part a small embryo with superior radicle. *Garrya* consists of shrubs from the south-west of North America and the Antilles. They have tetragonal branches and persistent, opposite, petiolate leaves without stipules, with limb entire or denticulate, penninerved. The petioles are connate at the base. The flowers are axillary and terminal. The males are grouped in pendent catkins furnished with decussate bracts connate like the leaves. In the axil of each is one flower or one biparous and triflorous cyme, rarely more.[3] The females are also in clusters, with not unfrequently a terminal flower.[4] The others occupy the axil of decussate bracts, which even become leaflike. Some eight species of *Garrya*[5] are distinguished, nearly all Mexican and Californian. *G. Fadyeni* alone grows in Cuba and Jamaica.

Garrya laurifolia.

Fig. 60. Fruit (½).

Fig. 61. Long. sect. of fruit.

With A. L. DE JUSSIEU[6] the family *Cornaceæ* did not exist. He placed *Cornus* (with *Hedera*) in a section of the Honeysuckle Order, himself thereby giving, with his usual loyalty, a fine demonstration of the futility of separating absolutely the *Polypetalæ* from the *Gamopetalæ*. It was A. P. DE CANDOLLE[7] who established a distinct

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[1] They are described as sepals; but are probably two bracts drawn more or less up the receptacular axis.

[2] The exterior, on the separation of the floration, is dilated to a general fleshy aril, the cellules of which rapidly assume an enormous development.

[3] Generally destitute of lateral bracteoles.

[4] This often bears on the sides of the receptacle, near mid height of the ovary, the two bracts which alternate with the two preceding bracts mentioned above. The styles are superposed to them.

[5] BENTH. *Pl. Hartweg.* 50.—GRISEB. *Fl. Brit. W.-Ind.* 285 (*Fadyenia*).—HOOK. *Icon.* t. 33.—S. WATS. *King's Rep. Bot.* 421.

[6] *Gen.* (1789) 214, Ord. 3.—K. *H. B. K. Nov. Gen. et Spec.* iii. 430.

[7] *Prodr.* iv. (1830) Ord. 95.—*Corneæ* ENDL. *Gen.* 798, Ord. 165.

Order of *Corneæ*, which LINDLEY [1] in 1836 named *Cornaceæ*. Under this named BENTHAM and HOOKER [2] have united in one family the *Corneæ* proper, the *Alangieæ*, the *Garryeæ*, and the *Nyseæ*, the whole comprising twelve genera. We retain, for reasons stated, only the genera *Cornus*, *Corokia*, *Aucuba*, ? *Kalyphora*, *Griselinia*, *Torricellia*, *Garrya*; but we add *Helwingia*, referred by BENTHAM and HOOKER to the family *Araliaceæ*, close beside *Meryta*.

These eight genera belong to very different countries. The *Garryas* are all American, growing in the south-west of N. America, except one species in the Antilles. To America belong some species of *Cornus*, and nearly all the genus *Griselinia*. The other *Cornaceæ* are of the old world; *Kaliphora* from Madagascar; *Aucuba* from the temperate regions of Asia, as also *Helwingia* and *Torricellia*; *Corokia* and two *Griselinias* from New Zealand. The Cornels of the old continent are Asiatic and European. There are two French species, *Cornus mas* and *sanguinea*. The latter grows as far as Norway in one direction, and in the other in southern Russia, Altai and around lake Baikal. *C. suecica*, a small herbaceous species, extends to Lapland, Greenland, Kamtchatka, and in America to Terra Nova, where grows also a very similar herbaceous species, *C. canadensis*. The whole family comprises only some fifty species, of which about half belong to the genus *Cornus*.

All the *Cornaceæ* known have common characters very general if not constant: the woody consistance of the stems,[3] the absence of stipules, the independence of the petals, the isostemony of the andrœcium; the concave form of the receptacle, and consequent epigynous insertion of the corolla and stamens; the descending direction of the ovule, with the position of the micropyle immediately below the point of attachment, and the dorsal position of the raphe, the fleshy consistence of the pericarp and the presence of albumen in the seeds. Some of these characters only distinguish them from the neighbouring families, the polypetaly from the *Caprifoliaceæ*; the direction of the micropyle from the *Araliecæ*, in which it is turned upwards and outwards,[4] that is on the side opposite that of the hilum.

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[1] *Introd.* ed. 2, 49; *Veg. Kingd.* (1846) 782, Ord. 298.

[2] *Gen.* (1867) 947, Ord. 82.

[3] Except a couple of herbaceous species of *Cornus*.

[4] That is why *Mastixia*, the descending ovule of which has the micropyle exterior and superior, can only be placed near *Arthrophyllum*, in which the direction is the same, and not among the *Cornaceæ*. It is why also *Helwingia*, ranged

In the *Haloragea*,[1] the flower of which has many analogies with that of the *Corneæ*, the raphe is dorsal as in the latter; but the habit is different; the fruit, finally dry and indehiscent, 2–4-merous like the ovary, and the flowers, nearly always diplostemonous,[2] very often polygamous or monœcious. It has been seen that we divide this family into two series:—

I. Corneæ.—Flowers 4, 5-merous, rarely 6-merous, hermaphrodite or unisexual, with simple or double perianth. Ovarian cells complete and placentas axile. Seeds without aril. Inflorescence in ramified or capitate cymes.—7 genera.

II. Garryeæ.[3]—Flowers 4-merous, unisexual, with simple perianth (corolla ?). Ovarian cells incomplete and placentas parietal. Seeds arillate. Inflorescence amentiform.—1 genus.

Uses.[4]—The plants of this family are generally rich in tannic substances,[5] particularly in their bark, more rarely in their leaves and green fruit; which has led to their being extolled as astringent, tonic, febrifuge. This property is especially developed in the bark of *Cornus florida*[6] (fig. 46), which, in N. America, is esteemed as equal to that of the Cinchonas. Its wood, of a brown chocolate colour, is of great hardness. *C. mas*[7] (fig. 47–51), an indigenous species, with precocious yellow flowers, was formerly employed as an astringent; its leaves and bark were chiefly esteemed. Its elongate, drupaceous fruit[8] has a flesh at first harsh, then sweet and acidulous, also em-

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by some (B. H. *Gen.* 939) among the *Araliaceæ*, beside *Meryta*, cannot be near the latter, which has the raphe ventral. Decaisne places *Helwingia* "in relation with the *Araliaceæ*," not very clearly, as might be expected of one who (*Bull. Soc. Bot. Fr.* ii. 87) in 1855 took *Polyosma* for *Corneæ ?* (See *Bull. Soc. Linn. Par.* 139.)

[1] Duchartre (*Elém.* edit. 2, 1123) distinguishes the latter by their pluriovulate cells.

[2] The only exception is in the genus *Proserpinaca* the androecium of which is isostemonous.

[3] *Garryaceæ* Lindl. *Bot. Reg.* t. 1686; *Veg. Kingd.* (1846) 295, Ord. 97.—Endl. *Gen.* 288. Decaisne wrongly retains the genus *Simmondsia* in this group, of which he gives other erroneous characters, particularly of the ovary, and which he connects with the *Hamamelideæ*.

[4] Endl. *Enchirid.* 397.—Lindl. *Veg. Kingd.* (1846) 782.—Rosenth. *Synops. Pl. Diaphor.* 569.

[5] Geiger (*Ann. Chem. und. Pharm.* xiv. 266) has extracted a bitter substance, in needle-like crystals, called *cornine* or *cornic acid.*

[6] L. *Spec.* 1661.—Catesb. *Carol.* t. 27.—Mér. et Del. *Dict. Mat. Méd.* ii. 436.—Curt. *Bot. Mag.* t. 526.—Bigel. *Med. Bot.* ii. t. 28.—Guimp. *Abb. Holz.* t. 19.—Rafin. *Med. Bot.* t. 28.—Schm. *Œstr. Buumz.* ii. t. 52.—DC. *Prodr.* iv. 273, n. 14.—Lindl. *Fl. Med.* 81 (*Dogwood bark*).

[7] L. *Spec.* 171.—Sibth. *Fl. Græc.* t. 151.—Turp. *Dict. Sc. Nat.* Atl. t. 103.—DC. *Prodr.* n. 13.—Gren. et Godr. *Fl. de Fr.* ii. 2.—Guib. *Drog. Simpl.* edit. 6, iii. 199.—*C. mascula* Auctt.

[8] Red, violet, white or yellow.

ployed as slightly astringent. *C. sanguinea*,[1] a species common in our woods, has a bitter and nauseous fruit; its seeds contain a fleshy albumen, tolerably rich in oil fit for burning. In *C. circinata*[2] and *sericea*,[3] North American species, the bark is not only bitter-astringent, but also slightly aromatic, owing to a certain quantity of essential oil associated with the tannin. In the same regions the bark of *C. striata*[4] and of *C. alba*[5] is used in medicine; the wood is hard and is useful for cabinet work and joinery. *C. canadensis*[6] and *suecica*,[7] small herbaceous species, have sweet insipid fruit eaten in many countries. The Cornels of the section *Benthamia*, particularly *C. capitata*,[8] have compound fleshy and edible fruit. SIEBOLD mentions *C. officinalis*, a Japanese plant, from the fruit of which are prepared antiseptic drinks prescribed in cases of bilious and putrid fever. *Garrya* has round its seed an acidulous arillate pulp. In Japan the mountaineers eat as vegetables the young shoots of *Helwingia japonica*. *Cornus sanguinea*, *alba*, *paniculata*, *Thelicani*, *alternifolia*, *mas*, &c., are cultivated in our gardens, more for their foliage or their fruit than for their small white or yellow flowers. *C. florida* and *capitata* on the contrary produce a tolerably good effect by their white bracts which constitute the involucre of the inflorescence. The fruit of the latter is not without merit, and somewhat resembles a large strawberry. Some *Garryas* are cultivated in gardens, the slender and pendent male catkins having an elegant appearance; also *Helwingia japonica* (fig. 52, 53), curious for its inflorescence situated in the upper surface of the leaves,[9] and in conservatories the *Griselinias* of New Zealand, the flowers of which are insignificant, but its leaves are persistent and of a fine brilliant green. But the best known for

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[1] L. *Spec.* 171 (not FORSK.).—GUIMP. *loc. cit.* t. 3.—DC. *Prodr.* n. 5.—MÉR. et DEL. *loc. cit.* 436.—GREN. et GODR. *loc. cit.* 3.

LHÉR. *Corn.* 7, n. 8, t. 3.—DC. *Prodr.* n. 8.—LINDL. *Fl. Med.* 82.—SCHM. *Œstr. B.* ii. t. 69.—*C. rugosa* LAMK. *Dict.* ii. 115.—*C. tomentulosa* MICHX. *Fl. Bor.-Amer.* i. 91.

[3] LHÉR. *loc. cit.* t. 2.—DC. *Prodr.* n. 7.—LINDL. *Fl. Med.* 81.—*C. cærulea* LAMK.—*C. cyanocarpa* MILL. BARTON says that its bark, as a tonic, approaches nearest to the Cinchona. It is also a powerful diarrhœtic (ROBINSON).

[4] LAMK. *Dict.* iii. 116.—DC. *Prodr.* n. 4.

[5] L. *Mantiss.* 40.—PALL. *Fl. Ross.* t. 34.—DC. *Prodr.* n. 6.—*C. stolonifera* MICHX.

[6] L. *Spec.* 172.—LHÉR. *Corn.* t. 1.—CURT. *Bot. Mag.* t. 880.—DC. *Prodr.* n. 16.—PAYER, *Elém.* 90, fig. 142.

[7] L. *Spec.* 172.—ŒD. *Fl. Dan.* t. 5.—SOW. *Engl. Bot.* t. 310.—*C. herbacea* L. *Fl. Lapp.* t. 5, fig. 3. The use of its fruit is said to increase appetite [*Lus-a-chrasis* (LINDL. *Veg. Kingd.* 783); in Sweden, *Hoensébaer*, *Smörbaer*].

[8] WALL. *Roxb. Fl. Ind.* i. 414; *Pl. As. Rar.* iii. 10, t. 214.—DON, *Prodr. Fl. Nepal.* 141.—DC. *Prodr.* n. 10.—*Benthamia fragifera* LINDL. *Bot. Reg.* t. 1579.—SIEB. et ZUCC. *Fl. Jap.* i. 39.—HOOK. F. *Bot. Mag.* t. 4641.

[9] The male is especially cultivated.

their foliage of the *Cornaceæ* cultivated in our gardens are the *Aucubas*, chiefly *A. japonica* [1] (fig. 54–56), whose persistent leaves are green or variegated with yellow or white,[2] and which now abounds with red fruit [3] most graceful in effect. The taste of their flesh is sweetish at complete maturity; but that of their seed is disagreeable. A closely allied species, *A. himalaica*,[4] has also been cultivated for many years. Since they have been raised from seed, both have given a very considerable number of forms.

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[1] Thunb. *Fl. Jap.* 64; *Ic. Fl. Jap.* t. 12, 13.—Banks, *Kœmpf. Icon.* t. 6.—DC. *Prodr.* iv. 274.—Sims, *Bot. Mag.* t. 1197.—Hook. *Bot. Mag.* t. 5512.—*Aukuba* Kæmpf. *Amœn. Exot.* 775 (*Aôki*).

[2] These horticultural varieties are sometimes wrongly considered as species.

[3] Although flourishing in our gardens since the introduction of the female plant into Europe in 1783, none were fertile and none were produced till the recent importation of male individuals; so that this plant furnishes one of the best refutations of the dangerous theory of parthenogenesis still defended by some botanists, particularly by Mr. Decaisne. What is remarkable (and which has been stated of several other plants with dicœcious flowers) is that *A. japonica*, before the introduction of the male plants, sometimes produced fruit of tolerable size, of red colour and apparently healthy, with sometimes a yellowish rudiment of an embryo. But these unfecundated seeds did not germinate, whilst very numerous germinations are obtained when the female flowers can be subjected to the influence of the pollen, or the latter carried to them by insects.

[4] Hook. f. *Illustr. Himal. Plants*, t. 12.

GENERA.

I. CORNEÆ.

1. **Cornus** T.—Flowers hermaphrodite regular, receptacle obconical, turbinate or urceolate, very concave, enclosing adnate germen. Calyx short, inserted in mouth of receptacle, 4-dentate. Petals 4, inserted with calyx, valvate. Stamens 4, epigynous, alternating with petals; filaments slender, inserted under epigynous pulvinate sometimes tubular or thin disk, inflexed at apex; anthers introrse, versatile, 2-celled, 2-rimose. Germen inferior, 2- or more rarely 3, 4-celled; style erect simple, at apex stigmatose clavate or truncate or capitate, sometimes obscurely lobed. Ovules in cells solitary, inserted at top of internal angle, descending; micropyle introrsely superior, finally often lateral. Fruit drupaceous, areolate at apex; putamen 2- or more rarely 3, 4-celled. Seeds in cells solitary, descending; coat thin; albumen fleshy; embryo subequal to albumen, or more rarely more or less incurved; cotyledons foliaceous or narrow; radicle terete superior.—Trees, shrubs, or more rarely herbs, glabrous or sericious; leaves opposite or rarely alternate, exstipulate, petiolate, or subsessile, entire or serrulate; flowers (springing before or after the leaves) in 2-chotomously ramose compound corymbiform cymes, or in capituliform glomerules; bracts around flowers small, imbricate or sometimes large 4–8, petaloid involucrate; fruit free, sometimes (*Benthamia*) confluent in areolate fragiform syncarp. (*Europe, Asia, and both temp. Americas.*) —*See p.* 66.

2. **Corokia** A. Cunn.—Flowers (nearly of *Cornus*) oftener 5-merous; sepals valvate. Petals 5, longer, externally sericeous, generally with small internal scale at base; prefloration valvate.

Stamens 5, alternipetalous. Germen inferior, 2, 3-celled; cells sometimes incomplete at apex; disk epigynous fleshy; style erect, at apex stigmatose, 2, 3-lobed. Ovules in cells solitary, descending, inserted at top of septum there thickened; raphe dorsal. Fruit drupaceous; seeds albuminous; cotyledons of elongate embryo inferior linear.—Small trees or shrubs, in part white-tomentose; leaves alternate (evergreen), sometimes sub-fasciculate, entire, coriaceous; flowers in more or less ramose racemes, solitary in axil of each bract or few cymose, sometimes axillary to leaves; pedicels not articulate. (*New Zealand.*)—*See p.* 68.

3 ? **Kaliphora** Hook. f.—Flowers (nearly of *Cornus*) 1-sexual, 4-merous; receptacle in males short, in females cupular concave. Male calyx gamosepalous, 4-lobed. Petals 4, much longer, valvate or scarcely imbricate. Stamens 4, alternipetalous; filaments short slender, inserted around thick sinuate disk; anthers introrse apiculate; connective broad; cells discrete, longitudinally rimose. Female calyx short, inserted at margin of receptacle, 4-dentate. Corolla . . . ? Germen (in male flower rudimentary conical) to middle adnate to receptacle, 2-celled, above free and attenuated to a short thick recurved-2-lobed style and there stigmatose within. Ovules in cells solitary, descending; micropyle superior within (?), oftener finally lateral. Drupe small compressed; pyrenes 2, compressed, 1-spermous. Seed oblong; albumen fleshy; cotyledons of linear embryo flat; radicle superior or oblique short.—A glabrous shrub (?), "rich in potassium;" leaves alternate, oblong-lanceolate entire coriaceous; flowers (small) in short drooping compound axillary cymes; female pedicels 2-bracteolate, not articulate. (*Madagascar.*)—*See p.* 69.

4. **Helwingia** W.—Flowers dicœcious subasepalous; receptacle of males short depressed; of females saclike or campanulate very concave, and enclosing adnate germen. Perianth (corolla ?) 3–5-merous; folioles valvate. Stamens (in female flower 0) 3–5, alternating with folioles of perianth; filaments inserted under flat 3–5-angular disk, thick incurved; anthers short introrse; cells discrete, rimose. Germen (in male flower rudimentary depressed-conical or 0) inferior, 3, 4-celled, crowned with epigynous disk and style presently divided into as many recurved-patent branches stigmatose within. Ovules in cells solitary descending; micropyle introrsely

superior; raphe dorsal; funicle short incrassate. Fruit drupaceous; pyrenes 1–4, sometimes thin; seeds compressed descending albuminous; embryo . . . ?—Glabrous shrubs; leaves alternate simple; stipules ciliate-ramose, small or 0; flowers solitary or in generally few-flowered axillary bracteolate cymes, and adnate to costa to middle of upper surface of leaf; pedicles short, not articulate. (*India, Japan.*)—*See p.* 69.

5. **Aucuba** Thunb.—Flowers dicœcious, often 4-merous. Receptacle of male flower short depressed; calyx gamosepalous small, shortly 4-dentate. Petals 4, much longer, valvate, induplicate at apex. Stamens 4, alternipetalous; filaments short inserted under minutely 4-lobed disk; anthers oblong, introrse, 2-rimose. Germen rudimentary in centre of disk, concave or 0. Receptacle of female flower long ovoid or tubular, enclosing adnate germen, bearing at margin 4 calycinal teeth and as many alternate valvate or induplicately valvate petals. Germen inferior, 1-celled; crowned with rather fleshy disk and short thick style, sulcate within and at apex stigmatose and unequally capitate. Ovule in cell 1, ventral, inserted under apex, descending; coat simple; micropyle introrsely superior; funicle short incrassate. Fruit baccate ovoid, crowned with teeth of calyx or their scars and short style. Seed descending, coat membranous; albumen copious horny; embryo 3, 4-times less than albumen; cotyledons short; radicle terete superior.—Glabrous shrubs; leaves opposite, petiolate, ovately lanceolate serrate coriaceous glossy (blackening when dry); flowers in compound cymiferous racemes; pedicels articulate, 2-bracteolate. (*Temp. India, China, Japan.*)—*See p.* 70.

6. **Griselinia** Forst.—Flowers (nearly of *Aucuba*) dicœcious, 4, 5-merous. Receptacle of male flower short; calyx short dentate. Petals more or less imbricate. Stamens as many alternate, inserted under central lobed disk; anthers oblong or sub-2-dymous, introrse, sometimes subbasifixed, 2-rimose, sometimes 4-locellate. Receptacle of female flower ovoid or tubular, enclosing adnate germen; style soon or from the base divided into 3 short recurved branches, at apex stigmatose within; cells 1–3; fertile oftener 1; the others generally effete. Ovule descending (of *Aucuba*); raphe dorsal, funicle short incrassate. Fruit baccate, oftener 1-, more rarely 2-spermous; seed

descending, &c., of *Aucuba*.—Trees or shrubs, sometimes climbing, glabrous; leaves alternate, more or less unsymmetrical, entire, angular, or spinosely dentate; petiole at base dilated on both sides to a subvaginate lamina, articulate; flowers in simple or oftener ramose cymiferous racemes; pedicels articulate. (*New Zealand, temp. and mount. Brazil, Chili.*)—*See p.* 71.

7. **Torricellia** DC.—Flowers dicœcious; receptacle of males small, widely obconical. Sepals 5, or more rarely 3, 4, various in form, generally short. Petals longer, concave, induplicate-valvate, inflexed at apex. Stamens same in number and alternating with petals; filaments short, inserted under flattish disk; anthers introrse, 2-rimose. Receptacle of female flower saclike ovoid, enclosing adnate germen. Calyx inserted at mouth of receptacle, short, unequally 3–6-lobed. Germen inferior (in male flower rudimentary, very small or 0), 3–5-celled; style branches 3–5, rather thick, generally papillose except at back, subentire or 2-fid at apex. Ovule in cells (often in part sterile) 1, descending; micropyle introrsely superior; funicle short, above micropyle thickened to obturator. "Drupe ovoid oblique, crowned with style; putamen crustaceous, many-celled, 1-spermous. Seed curved; coat membranous; albumen fleshy; embryo very small obcordate."—Small branched trees; branches marked with scars of leaves medullose; leaves alternate, petiolate, cordately rotundate digitately 5–7-nerved, clearly dentate, deciduous; petioles articulate at base, vaginate; flowers in pendulous very ramose compound cymiferous racemes; male pedicels not articulate; female thicker 2–3-bracteolate under articulation. (*Temp. mount. India.*)—*See p.* 72.

II. GARRYEÆ.

8. **Garrya** Dougl.—Flowers dicœcious; receptacle of males small obconical. Calyx (?) scarcely conspicuous, rarely rather large, very shortly 4-dentate (or 0). Petals (?) 4, 2 anterior, 2 posterior, externally pilose at apex, valvate or slightly imbricate. Stamens 4, alternipetalous; filaments free slender; anthers introrse, 2-celled, 2-rimose. Germen rudimentary central hollowed or scarcely visible. Receptacle of female flower saclike or shortly lageniform, sometimes

bearing externally 2 lateral bracteoles more or less adnate to receptacle, and enclosing adnate germen. Perianth and disk 0. Germen 1-celled (or very incompletely 2, 3-celled); style branches 2, lateral (rarely 3), slender, erect or recurved, longitudinally stigmatose within. Ovules at top of parietal placentas solitary, descending; micropyle extrorsely superior; funicle more or less elongate and dilated above micropyle to obturator. Fruit baccate, sparsely fleshy or coriaceous, crowned with persistent styles. Seeds 1–3, descending; external coat dilated to cellulose fleshy (coloured and tasty) aril; albumen fleshy copious; cotyledons of small apical embryo oblong; radicle superior terete.—Shrubs; leaves (evergreen) opposite petiolate exstipulate, entire or denticulate, penninerved; flowers in solitary or 3-nate catkins; male catkins pendulous sericeous; bracts of catkin decussate deeply connate in pairs; flowers solitary in axils of each bract (*Fadyenia*) or cymose or glomerulate few, ebracteolate. (*South-west. N. America, Cuba, Jamaica.*) See p. 72.

LXII. UMBELLIFERÆ.

I. CARROT SERIES.

Daucus Carota.

Fig. 62. Floriferous branch ($\frac{1}{2}$).

In the extensive family of *Umbelliferæ*, we take as the first object

of study the Carrot, which belongs to the genus *Daucus*[1] (fig. 62–67). Its flowers are hermaphrodite,[2] with a concave, saclike, receptacle, in the very narrow mouth of which are inserted the perianth and androecium, whilst its cavity contains the ovary and its external surface bears salient ribs which we shall find more developed in the fruit. The perianth then is superior, and, as said, epigynous. It is double : a calyx, represented by five small teeth,[3] of which one is posterior, two are lateral and two anterior, and a corolla of five alternate petals. These are nearly equal in the innermost flowers of the inflorescence, but become gradually more unequal towards the outermost. The anterior is the largest, the posterior the smallest.[4] All have a short claw and are dilated to a limb which at first appears bilobed. In reality, the pointed end of the organ is greatly inflexed and united for a variable extent to the interior surface

Daucus Carota.

Fig. 64. Diagram.

Daucus Carota.

Fig. 63. Flower ($\frac{2}{1}$).

Fig. 65. Long. sect. of flower.

of the middle nerve. On each side, consequently, the petal forms a sort of hollow bowl. In the lateral petals these hollows are unequal. The prefloration of the corolla is valvately reduplicate. There are five stamens to the androecium, "epigynous," inserted, like the

[1] T. *Inst.* 307, t. 161.—L. *Gen.* n. 333.—Adans. *Fam. des Pl.* ii. 99.—J. *Gen.* 224.—Gærtn. *Fruct.* i. 79, t. 20.—Lamk. *Dict.* i. 633 ; Suppl. ii. 116 ; *Ill.* t. 192.—DC. *Prodr.* iv. 209. —Spach, *Suit. à Buffon*, viii. 150.—Endl. *Gen.* n. 4497.—Hook. *Fl. Ind.* ii. 718.—B. H. *Gen.* 928, n. 145 (incl. : *Caucalis* L. *Torilis* DC. *Turgenia* Hoffm. *Ammiopsis* Benth.).

[2] Or not unfrequently polygamous.

[3] Which may also be totally wanting.

[4] In the lateral petals, the posterior lobe is ordinarily a little smaller than the other.

petals, under the margin of the stylopod, and alternate. Each is formed of a filament incurved in the bud, and a bilocular didymous anther, with cells dehiscing by an introrse longitudinal cleft.[1] The ovary, inferior, has two cells, anterior and posterior. Each contains in its internal angle one[2] descending, anatropous ovule, with micropyle turned upwards and outwards.[3] The ovary is surmounted by two

Daucus Carota.

Fig. 66. Fruit ($\frac{5}{1}$).

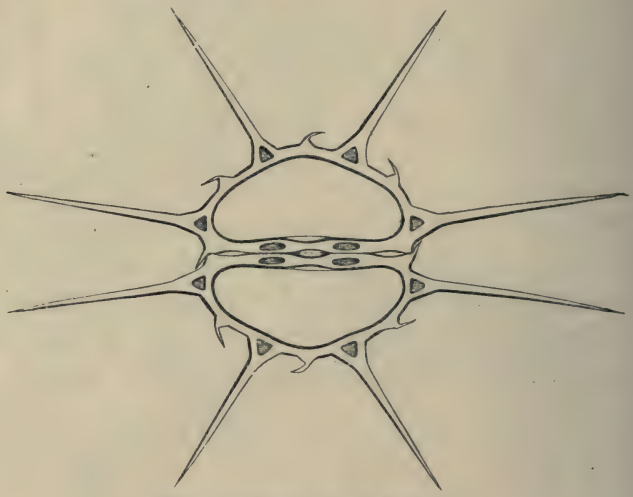

Fig. 67. Trans. sect. of fruit ($\frac{12}{1}$).

erect styles, attenuated towards their stigmatiferous summit. At the base each style is externally dilated to a thick semicircular disk, which covers the summit of the ovary and is called the *stylopod.*[4]

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[1] Or nearly marginal. The pollen of the *Umbelliferæ* is described by H. Mohl (*Ann. Sc. Nat.* ser. 2, iii. 324) as formed of grains "nearly cylindrical with rounded extremities; three furrows; in water, ovoid with three narrow bands and three papillæ; external membrane very finely granular."

[2] There are exceptionally two, one of which is most frequently small and not fertile. It is the trace of a primitive disposition observed by Payer in *Heracleum*, according to which each ovarian cell is at first biovulate.

[3] There is but one coat and that very incomplete and there are cases in which it may be said to be almost wanting (see H. Bn. *Compt. Rend. Acad. Sc.* lxxxv. 1178; *Adansonia*, xii. 103, 108, 120).

[4] Duchartre (*Elém.* edit. 2, 739) thinks that the "epigynous disk greatly thickens almost hemispherically over the ovary, apparently surrounds the base of the style, and is then called *stylopod*;" here certainly incorrect. Elsewhere (p. 1130) he says that the stamens "as well as the corolla are inserted on an epigynous disk," and farther on, that the two styles "form at their base an enlargement called a *stylopod*;" from which it would appear that he admits these two distinct organs. On examining either the commencement or the adult state of what he calls the disk of an Umbellifer, he might have seen that the androecium and corolla are inserted not on this organ, but below it, at the margin of the receptacular sac.

At maturity, the fruit, enveloped in the receptacle to which it adheres, is a *diachene* finally separating into its two component achenes,[1] between which is a slender column (*columella* or *carpophorum*[2]) often divided in its upper part into two branches, each rising above the middle line of the ventral face of the achene. One of the achenes, the anterior, is surmounted by the two very short but persistent anterior sepals; the other, the posterior, bears three.[3] Vertical nervures traverse the entire length of the back of each achene. There are first five primary ridges,[4] then a middle dorsal, two marginal which correspond to the margins of the achene, and two lateral, intermediate between these and the middle one. These ridges are not very prominent, and their free margin is charged with small superposed prominences, surmounted by a variable number of small hairs. Between these nervures are four secondary ridges,[5] which in the Carrot are more developed than the primary. Their free margin is divided into conical points, ranged in a single vertical line. The secondary ridges are inserted in their entire length in the vertical furrows of the achene called *valleculæ*. These contain linear reservoirs of coloured and odorous gum-resinous juice called *vittæ*.[6] The surface by which the two achenes are united is named the *commissure*.[7] This may also bear two bandlets, one on each side of the middle line. In the interval between the two commissural vittæ, the surface of the achene is flat or very slightly convex, like the internal surface of the seed on which the pericarp appears to rub. In each achene is a descending seed,

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[1] Or mericarps (*mericarpia*). They are formed for the most part of the concave receptacle, the part representing the carpellary leaves here occupying only the upper portion of the fruit.

[2] *Columella*, *carpophorum*. It is often undivided in the genus *Daucus* as in many others. DUCHARTRE (*op. cit.* 1129) is therefore wrong in giving as a general character of the *Umbelliferæ* "mericarps suspended by a bipartite filament." Genera have even been founded on the divided or undivided character of the carpophor (see, on the nature of the carpophor, H. MOHL, *Bot. Zeit.* (1863) 264;—H. BN. *Bull. Soc. Linn. Par.* 161).

[3] From this is evident the error of those who suppose that the primary ridges correspond to the middle nervures of the sepals. If this theory were admissible, there would be as many sepals on one mericarp as on the other, since they have each the same number of primary ridges. The surface of carpellar separation, near the insertion of the sepals, is not flat but undulated. M. DE LANESSAN (*Bull. Soc. Linn. Par.* 17, 23) has much better observed the comportment of the sepals and ridges at the time of dehiscence, as the disjunction of the carpels in the *Umbelliferæ*, themselves indehiscent, is often called. It is the receptacle enclosing the carpels which separates into two halves.

[4] *Juga primaria* or *carenalia*.

[5] *Juga secundaria* or *suturalia*.

[6] These reservoirs belong to the category o secreting canals. On their constitution, se TRÉCUL, *Ann. Sc. Nat.* ser. 5, v. 275.

[7] Or commissural, ventral face.

whose thin coat,[1] covers a hard horny albumen, near the summit of which is lodged a very small rectilinear embryo, with short superior radicle.

The Carrot is a dicarpous herb, with a tap root, stem and branches often downy, like most of the plant, channeled and hollowed, in which are inserted alternate leaves very variable in form. The lower are complete, with a petiole dilated to a sheath at the base and a decompound pinnate limb with narrow and sharp segments. Other leaves, as the upper, are without petiole; the limb immediately follows the sheath. Finally, towards the top of the plant, the leaves become bracts, represented by the sheath, surmounted by a very reduced limb, which itself may entirely disappear near the inflorescence. The latter is a compound umbel,[2] terminating a branch, the conical summit of which forms the principal axis of the umbel. The base of the small cone is surrounded by a collarette of bracts, all or part dissected, and called an involucre. From their axil spring the secondary axes, thin and incurved, connivent even in the fruit. Near the top of these pedicels are other bracts of the second degree, the union of which forms an involucel. They are entire or 2, 3-fid. In their axil are pedicels or axes of the third degree, each terminating in a flower.[3]

There are some species of *Daucus*, as *D. brachiatus*, *toryloides*, &c., the seed of which has in the middle of its internal surface a shallow vertical furrow. It is more marked in *D. pulcherrimus*, whose seed presents a crescent-shaped transverse section with ventral concavity. The same is observed in *Torilis*,[4] particularly in *T. Anthriscus* (fig. 68), the primary and secondary ridges of which have prominences more marked and a little less regularly disposed in vertical series. In *Caucalis*,[5] recently considered inseparable from *Torilis*, there are all the intermediate gradations

Daucus (*Toril s*) *Anthriscus.*

Fig. 68. Trans. sect. of seed (⁸/₁).

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[1] On the mode of formation of this coat, see H. Bn. *Adansonia*, xii. 103, 108, 120.

[2] Umbel of umbellules.

[3] Carrots are sometimes found with umbels and umbellules terminated by a central flower, generally more developed than the normal flowers, and of a deep colour. (Germ. *Bull. Soc. Bot. Fr.* i. 121.)

[4] Adans. *Fam. des Pl.* ii. 99.—Gærtn. *Fruct.* i. 82.—Hoffm. *Umbell.* 49, t. 1.—Spreng. *Prodr. Umbell.* 24.—Koch, *Umbell.* 80, t. 15.—DC. *Prodr.* iv. 218.—Endl. *Gen.* n. 4503.

[5] L. *Gen.* n. 331.—Hoffm. *Umbell.* 54.—Koch, *Umbell.* 79.—DC. *Prodr.* iv. 216.—Endl. *Gen.* n. 4501.—B. H. *Gen.* 928, n. 146.—Hook. *Fl. Ind.* ii. 718.—*Agrocharis* Hochst. *Flora* (1844) 19.

between this shallow concavity in the internal face of the seed and a very deep furrow around which the margins of the seed may even be largely involute (fig. 69). There is also every possible degree in the size of the hairs on the primary and secondary ridges. They are, for example, quite erect, rigid and sharp in *C. latifolia*, type of a genus *Turgenia*,[1] whilst in *C. daucoides*, those of the secondary nervures are more developed. Each ridge may bear one or two series, more rarely three. Under the secondary, vittæ of little thickness, are always found in *Lisœa*,[3] the hairs of which vary much in size, as well on the primary as on the secondary ridges,[4] and vittæ very thin or even almost nil in *Turgeniopsis*,[5] the fruit of which is otherwise nearly that of *Caucalis*.[6]

Daucus (*Caucalis*) *Royeni*.[2]

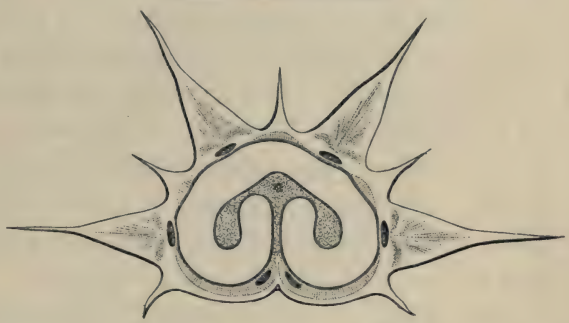

Fig. 69. Trans. sect. of fruit (♀).

On the other hand, in *Orlaya*,[7] which recent authors have rightly referred as a section to *Daucus*, the fruit and seed are much more compressed from front to back in nearly all the species, and the commissural face of the seed is flat or even slightly convex. The hairs of the secondary ridges are generally 2-seriate, but they may also be in a single series. From these examples it is evident that there

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[1] Hoffm. *Umbell.* 59. — Koch, *Umbell.* 80, f. 16.—DC. *Prodr.* iv. 217.—Endl. *Gen.* n. 4502.

[2] *Conium Royeni* L. *Spec.* 340. — *Caucalis daucoides* L. *Mantiss.* 351.—*Daucus leptophyllus* Scop. *Fl. Carniol.* i. 190.

[3] Boiss. *Ann. Sc. Nat.* ser. 3, ii. 54; *Fl. Or.* ii. 1087.—Endl. *Gen.* n. 4502[2].

[4] Here as in the true *Daucus* the points have a greater tendency to disappear at the internal than at the external margin of the fruit.

[5] Boiss. *Ann. Sc. Nat.* ser. 3, ii. 53; *Fl. Or.* ii. 1080.—*Glochidiotheca* Fenzl, *Russ. Reis.* i. p. ii. 970.—Endl. *Gen.* n. 4502[1].

[6] The ridges are also effaced in *Torilis trichosperma* Spreng. (*Umbell.* 142) of which Boissier has just made the genus *Chætosciadium* (*Fl. Or.* ii. 1078) and which, having the mericarps covered with setiform hairs, seems to connect the genus with *Psammogeton*. *Ammodaucus* (Coss. et Dur. *Kralik exs. Alger.*) is in other respects a *Daucus* with long and ciliate hairs, by these characters intermediate between other species of *Daucus* and *Chætosciadium*. Its seeds are flat or slightly concave within, and the same is the case with those of *Durieua* (Boiss. et Reut. *Diagn. Pl. Nov. Hisp.* 14), which has the flower of *Daucus*, except the petals, described as "small not radiating;" which all the more here constitute a sectional character.

[7] Hoffm. *Umbell.* 58.—Koch, *Umbell.* 78, fig. 12, 13.—DC. *Prodr.* iv. 269.—Endl. *Gen.* n. 4496.

are important characters in this family to which an absolute value for classification cannot be assigned, and that of the preceding types, only a certain number of sections [1] of the genus *Daucus* can be made. Thus constituted, it comprises scarcely forty species,[2] all herbaceous, annual or dicarpous, glabrous or clothed with soft or rigid hairs, straight or hooked, with decompound-pinnate leaves, inflorescence sometimes without involucels and even involucre, and inhabiting all the temperate regions of the five parts of the world.

Ammiopsis [3] *daucoides*, an annual of Morocco, has all the characters of vegetation and floration of *Daucus* and belongs to the same genus, although the primary and secondary ridges of the fruit are visible, but little prominent, especially the former, and the latter have, instead of hairs, a great number of granular protuberances. The vittæ are visible or little developed.

Close beside *Daucus* is ranged *Psammogeton triternatum*, an annual of Persia and eastern India, which, with the same general organization and a seed little concave or flat on the ventral surface, has a fruit whose ridges, both primary and secondary, bear a vertical series of long hairs with capitate extremity. Near this genus has been rightly placed *Exoacantha heterophylla*, a Syrian plant whose flower and fruit are those of *Ammiopsis*, with primary and secondary ridges little developed, but visible, with granulations much less distinct ; but the bracts of the involucre and involucels thicken into rigid spines, giving the plant the appearance of certain Thistles.

Cuminum (fig. 70, 71) is a glabrous annual, the organization of which is nearly that of *Daucus*, with the bracts of the involucre and

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[1] Daucus. Sect. 11.

1. *Eudaucus.*
2. *Ammodaucus* (Coss. et Dur.).
3. *Durieua* (Boiss. et Reut.).
4. ? *Chætosciadium* (Boiss.).
5. *Orlaya* (Hoffm.).
6. *Lisæa* (Boiss.).
7. *Turgeniopsis* (Boiss.).
8. *Torilis* (Adans.).
9. *Turgenia* (Hoffm.).
10. *Caucalis* (L.).
11. *Ammiopsis* (Boiss.).

[2] Desf. *Fl. Atlant.* t. 59–65.—Reichb. *Ic. Fl. Germ.* t. 1999–2011.—Sibth. *Fl. Græc.* t. 269–272.—Steinh. *Ann. Sc. Nat.* ser. 2, ix. 203, t. 8.—Boiss. *Voy. Esp.* t. 68 ; *Diagn. Or.* ser. 2, ii. 95, 98 ; vi. 89 (*Caucalis*) ; *Fl. Or.* ii. 1070 (*Orlaya*), 1071–1078, 1080–1088.—Moris, *Fl. Sard.* t. 77 *bis*.—Harv. et Sond. *Fl. Cap.* ii. 563, 564 (*Torilis*).—Benth. *Fl. Austral.* iii. 376.—Hook. f. *Handb. N. Zeal. Fl.* 98.—C. Gay, *Fl. Chil.* iii. 134.—A. Gray, *Man.* ed. 5, 191.—Chapm. *Fl. S. Unit. St.* 161.—Gren. et Godr. *Fl. de Fr.* i. 664.—Walp. *Rep.* ii. 419, 420 (*Caucalis*), 421 (*Turgenia, Torilis, Durieua*) ; v. 899, 900 (*Durieua*), 901 (*Turgenia*), 701 (*Turgeniopsis, Lisæa*), 903 (*Torilis*) ; *Ann.* i. 354 ; ii. 716, 717 (*Torilis*) ; v. 77, 78 (*Caucalis*).

[3] Boiss. *Diagn. Or.* ser. 2, ii. 96.—B. H. *Gen.* n. 142.—H. Bn. *Adansonia*, xii. 163.

involucel simple and slender. Its fruit is narrow, elongate, slightly compressed laterally, and the primary and secondary ridges are all visible, but little prominent, especially the former. They are covered

Cuminum Cyminum.

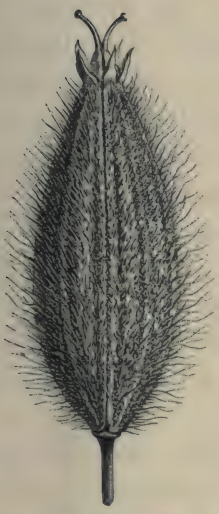

Fig. 70. Fruit (6/1).

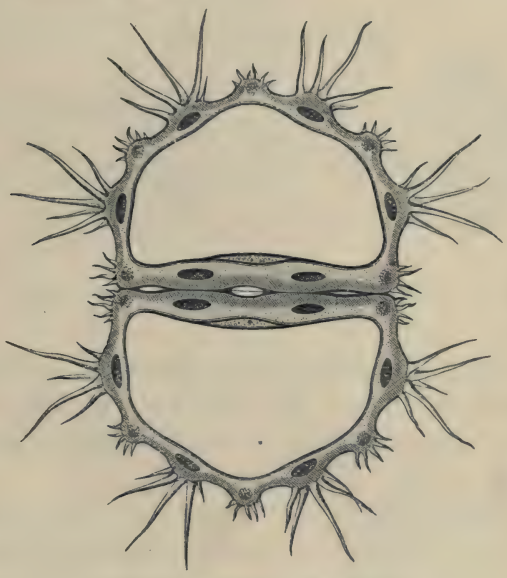

Fig. 71. Trans. sect. of fruit (12/1).

with very fine papillæ. It is an oriental plant, frequently cultivated in both worlds, the true origin of which is uncertain. We refer to this genus as a section, the American herb, *Trepocarpus*, a glabrous annual.

Artedia (fig. 72) is the type of another subseries (*Artedieæ*), in which the flowers, having a very irregular corolla, are, in other respects, similar to those of the Carrots. The fruit is ovoid, with the primary and secondary ridges linear and little prominent, with the exception of two lateral which, in each carpel, are developed to a large vertical wing, cut into deep oboval or obtrapezoid lobes. *A. squamata* is a glabrous annual from the East and northern Africa, the inflorescence of which is equally that of *Daucus*.

Artedia squamata.

Fig. 72. Fruit (3/1).

Laserpitium (fig. 73, 74) has given its name to a tribe (*Laserpitieæ*); we refer it to the preceding types. The fruit is slightly compressed parallel to the commissure, and its primary and secondary ridges are visible. But whilst the primary are linear and little prominent, the secondary are developed into entire or dentelate wings, flat or nearly so, especially the marginal, which are ordinarily larger than the dorsal. The seed, in this genus, is flat or slightly concave on the ventral surface. There are a score of species of *Laserpitium*, perennial herbs, glabrous or hispid, with leaves, involucres and involucels formed of an indefinite number of linear bracts. They inhabit Europe, northern Africa and western Asia.

Laserpitium latifolium.

Fig. 73. Fruit.

Fig. 74. Trans. sect. of fruit (2/1).

Thapsia (fig. 75, 76) is very near *Laserpitium*. They are herbaceous and perennial plants. All the ridges of the fruit are linear, except the marginal secondary, which are dilated into large membranous wings. More rarely the dorsal also become aliform but remain much narrower. In the true *Thapsia* the ventral face of the seed is flat. In *Elæoselinum*, it becomes concave, with the margins much involute; so that it is to other *Thapsias* what *Torilis* is to *Daucus* proper. This genus is Mediterranean. Its fruit has vittæ only under the secondary ridges.

Thapsia garganica.

Fig. 75. Fruit (2/1).

Polylophium, a glabrous perennial herb of Persia and the neighbouring regions, has quite the organization of *Laserpitium*. But the ovoid fruit, dorsally compressed, has all the ridges dilated to short, undulate wings, divided and crumpled at the margin.

In *Melanoselinum* (fig. 77, 78), native of Madeira and Cape Verd, the stem is often erect and woody, and the inflorescence is furnished with involucre and involucels. The primary ridges are little prominent and the two lateral occupy a portion of the internal face of the

mericarp. The latter is much compressed from front to back, and has four dorsal secondary ridges much thicker and more prominent than the primary. The dorsal are like cord; the marginal, much

Thapsia garganica.

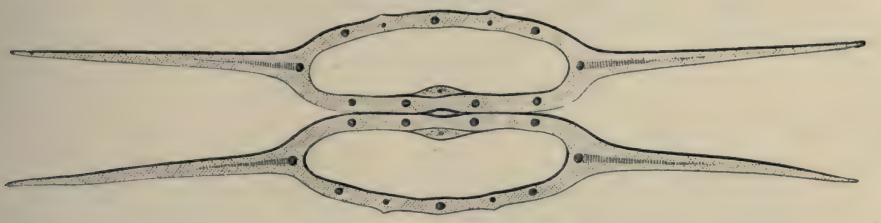

Fig. 76. Trans. sect. of fruit ($\frac{10}{1}$).

more flattened, are thick and divided into irregular teeth at the margin. Each covers a wide vitta. In *Monizia*, the marginal teeth are found only in the upper part and are less prominent (fig. 77, 78).

Melanoselinum (*Monizia*) *edule.*

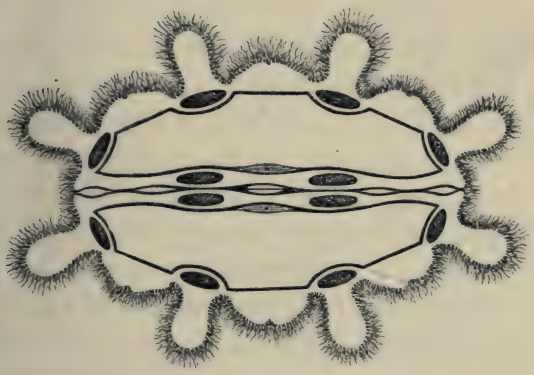

Fig. 78. Trans. sect. of mericarp ($\frac{5}{1}$).

Fig. 77. Fruit.

Still less so are they in *Tornabenia*, perennial herbaceous species growing only at Cape Verd, the fruit of which is shorter but its fundamental organization the same.

II. ECHINOPHORA SERIES.

We know that in the Carrots the flowers may be in part unisexual and that the umbellule may be terminated by a central flower, often

larger than the others and hermaphrodite or female. In *Echinophora*[1] (fig. 79, 80), the general inflorescence of which is fundamentally that of *Daucus*, the separation of sexes is still more complete, in that each umbellule has one central sessile flower, alone female and hermaphrodite (fig. 79). Around it are unequal pedicels,[2] each bearing a

Echinophora radians.

Fig. 79. Umbellule, the central flower alone fertile.

Fig. 80. Fruit surrounded by hardened and incurved pedicels.

male flower, in construction like that of *Daucus*, with very unequal petals, inflexed summit, and two styles of large conical basilar dilatation. The ovary has two cells, each containing a descending ovule, with long funicle and micropyle exterior. In the fruit, the transverse section of which is nearly circular, one of the cells is often aborted. There are no prominent ridges, or only primary ones, in all cases scarcely perceptible. What gives a peculiar appearance to this fruit (fig. 80) is that the male pedicels are hardened around it, as well as the receptacle of the terminant flower, and all these pedicels incurving round it, it is, as it were, encased within them. In the species of which the genus *Pycnocycla*[3] has been made, the receptacle of the umbellule and the pedicels, less incurved, form only a sort of cupule in the centre of which the fruit is situated without being encased. The vittæ are variable in number, often indefinite, whilst in the true *Echinophora*, they are ordinarily equal in number to that of the

[1] T. *Inst.* 566, t. 423 (not Riv.).—L. *Gen.* n. 329.—Adans. *Fam. des Pl.* ii. 102.—J. *Gen.* 225.—Lamk. *Dict.* ii. 338; *Ill.* t. 190.—Lag. *Amœn.* ii. 106.—Koch, *Umbell.* 135.—DC. *Mém.* 64, t. 16; *Prodr.* iv. 234.—Meissn. *Gen.* 150 (108).—Endl. *Gen.* n. 4522.—B. H. *Gen.* 881, n. 27.—*Anisosciadium* DC. *Mém.* 63, t. 15; *Prodr.* iv. 234.—Meissn. *Gen.* 150.—Endl. *Gen.* n. 4520.

[2] The exterior are the most developed.

[3] Lindl. *Royl. Ill. Himal.* 232, t. 51.—Endl. *Gen.* n. 4521.—B. H. *Gen.* 881, n. 28.—Hook. *Fl. Ind.* ii. 694.—*Dicyclophora* Boiss. *Ann. Sc. Nat.* ser. 3, ii. 89.

furrows. Thus constituted,[1] this curious genus comprises some fifteen species,[2] herbaceous, perennial, often spinous, natives of southern Europe, the Levant and northern Asia. The leaves are decompound-pinnate or dissected, and the compound umbels are terminal, accompanied by involucres and involucels whose bracts, indefinite in number, are often hardened and spinescent, like the pedicels of the sterile flowers.

III. PEUCEDAN SERIES.

The flowers of the Peucedans[3] are hermaphrodite,[4] regular or nearly so in the centre of the umbellules and irregular at the periphery. The receptacle is, in form, a deep sac, much compressed from front to back, and the margin of its mouth bears the perianth and androcium. The calyx is nil or represented by five small teeth, one of which is posterior and two are anterior. The petals, alternate and the same in number, are, in the irregular flowers, the more developed as they are anterior; they are oboval, attenuate at base, with the summit pointed and inflexed; which makes them appear, as in the Carrots, emarginate or bilobed. The five stamens, alternating with them, are inserted below the salient, entire or undulate, crenelate margin of the depressed-conical stylopod. The styles, longer or shorter, are generally subulate. The ovary, adnate to the cavity of the receptacular sac, which it entirely fills, is inferior, bilocular, and encloses in each cell a descending anatropous ovule,

Peucedanum Oreoselinum.

Fig. 81. Fruit (7).

Fig. 82. Trans. sect. of fruit.

[1] Echinophora. Sect. 4.
1. *Euechinophora.*
2. *Anisosciadium* (DC.).
3. *Dicyclophora* (Boiss.).
4. *Pycnocycla* (Lindl.).

[2] Sibth. *Fl. Græc.* t. 265, 266.—Reichb. f. *Ic. Fl. Germ.* t. 2031.—Jaub. et Sp. *Ill. Pl. Or.* t. 239–241, 242, 243 (*Pycnocycla*).—Boiss. *Diagn. Or.* ser. 2, ii. 105 (*Pycnocycla*); v. 104; *Fl. Or.* ii. 947, 950 (*Anisosciadium*), 951 (*Dicyclophora, Pycnocycla*).—Walp. *Rep.* ii. 424; v. 911 (*Pycnocycla*), 912; *Ann.* ii. 719 (*Pycnocycla*), 720.

[3] *Peucedanum* T. *Inst.* 318, t. 169.—L. *Gen.* n. 339.—J. *Gen.* 223.—Poir. *Dict.* Suppl. iv. 375.—DC. *Prodr.* iv. 176.—Spach, *Suit. à Buffon*, viii. 164.—Endl. *Gen.* n. 4462.—Hook. *Fl. Ind.* ii. 708.—B. H. *Gen.* 918, n. 125 (incl.: *Dorema* Don, *Ferula* L. *Pastinaca* L. *Scorodosma* Don, *Tiedemannia* DC.).

[4] Or more rarely polygamous.

with micropyle exterior and superior.[1] In the *Peucedans* proper,[2] it becomes a fruit much compressed parallel to the partition, elliptic, oval or more rarely oboval or suborbicular, the mericarps of which are slightly convex at the back, flat on the ventral surface and surrounded by a thin or winglike margin, entire. This margin, before maturity, is closely applied to that of the other carpel, so that the contour of the fruit has, at first, a perfectly simple appearance. On the back of the carpels are three fine primary ridges, often scarcely raised. The intermediate furrows, four in number, have vittæ almost always solitary and extending the entire length of the furrow. There are sometimes vittæ under the primary ridges and there is one at least on each side of the median line, on the commissural face of the carpels. The *Peucedans* are herbaceous plants, rarely shrubby, sometimes annual, glabrous or more rarely scabrous or hairy. The leaves are alternate, pinnati- or ternati-decomposite, rarely compound pinnate, with narrow or

Peucedanum Pastinaca.

Fig. 83. Fruit (4/1).

Peucedanum Pastinaca.

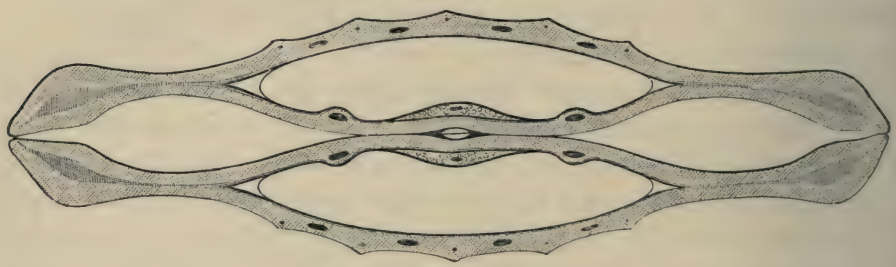

Fig. 84. Trans. sect. of fruit (12/1).

wide divisions, and the upper are often reduced to sheaths, sometimes surmounted by the remains of the limb. The umbels are terminal, compound, with bracts, indefinite in number, to the involucres and involucels which may also be wanting. This is particularly the case

[1] Its coat is sometimes single, very little developed and even almost nil. In some Peucedans 2 ovules are at first seen in each cell, one of which is ascending and soon aborted.

[2] *Eupeucedanum*. From this sect. I cannot separate *Xanthoselinum* Schur. *Enum. Pl. Trans.* 264 (*Tæniopetalum* Bge. *Mém. Sav. Étr. Acad. Pétersb.* vii. 303), the mericarps of which easily separate from each other.

in the Parsnip (*Pastinaca*[1] *sativa*), a species with yellow flowers and divisions in the large leaf, which however can constitute only a section in the genus *Peucedanum* (fig. 83, 84).

There are *Peucedans*, called *Oreoselinum*,[2] whose petals have a strongly impressed median nervure, and others, *Tæniopetalum*,[3] which owe this name to the presence of vittæ with a gum-resinous juice on their petals. In *Imperatoria*,[4] all the characters of the flower and fruit are those of other *Peucedans;* but the divisions of the leaves are large and the calyx is wanting, as in many other species of the genus. In *Anethum*,[5] the divisions of the leaves are fine, like those of the *Fennels*, and the aromatic odour is very distinct; but the fruit (fig. 85) is in miniature quite that of a *Peucedan;*[6] the flower is yellow. It is an annual and cultivated in most countries.

Peucedanum (*Anethum*) *graveolens.*

Fig. 85. Fruit (4).

Ferula[7] (fig. 86, 87) appears to us generically inseparable from the *Peucedans* and will form therefore only a section of that genus. The fruit is the same, and if it has a thicker margin, this difference is far from constant. The furrows also often contain two or three vittæ. But those named *Peucedanoids*[8] have only one, and in those of the group *Scorodosma*[9] (fig. 87), they are numerous and sometimes extremely

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[1] T. *Inst.* 319, t. 170.—L. *Gen.* n. 362.—DC. *Prodr.* iv. 188.—Endl. *Gen.* n. 4473. The vittæ of the Parsnips do not always extend to the base of the furrows; by this character they connect the Peucedans to *Heracleum*.

[2] Bieb. *Fl. Taur.-Cauc.* iii. 200.—Lag. *Amœn.* ii. 90.—Dub. *Bot. Gall.* t. 222.

[3] Vis. *Fl. Dalmat.* iii. 49 (not Bge.).

[4] T. *Inst.* 316, t. 168.—L. *Gen.* n. 359.—DC. *Prodr.* iv. 183.

[5] T. *Inst.* 317, t. 169.—L. *Gen.* n. 359.—Gærtn. *Fruct.* i. 91, t. 21.—DC. *Prodr.* iv. 185.—Endl. *Gen.* n. 4467.—Spach, *Suit. à Buffon*, viii. 159.

[6] It has solitary vittæ in each furrow, and its greatest difference from most of the preceding types is the small development of the secondary chambers formed near the margin by the reduplication of the partition, whilst in the Parsnip, for example, and several other Eupeucedans, these false cells are much larger. In *Ferula*, on the contrary, they disappear more or less completely. Then *Anethum*, in this respect, by its fruit, connects the Ferulas with the true Peucedans.

[7] T. *Inst.* 321, t. 170.—L. *Gen.* n. 343 (part).—Adans. *Fam. des Pl.* ii. 100.—J. *Gen.* 222.—Lamk. *Dict.* ii. 454; Suppl. ii. 630; *Ill.* t. 205.—Spreng. *Umb.* 13 (part).—Kock, *Umb.* 96.—DC. *Prodr.* iv. 171.—Spach, *Suit. à Buffon*, viii. 161.—Endl. *Gen.* n. 4459.—Hook. *Fl. Ind.* ii. 707.—B. H. *Gen.* 917, n. 123 (*Perula*).—H. Bn. *Dict. Encycl. Sc. Méd.* ser. 4, i. 728.—?*Soranthus* Ledeb. *Fl. Alt.* i. 344; *Ic. Fl. Ross.* t. 82.—DC. *Prodr.* iv. 669.

[8] Boiss. *Fl. Or.* ii. 983.

[9] Bge. *Rel. Lehm. Mém. Sav. Étrang. Acad. Pétersb.* vii. 309.—Borszcz. *Ferul. Off. Mém. Acad. Pétersb.* (1860) t. 1, 2.

fine or imperceptible. In *Ferula* also the inflorescence often has a peculiar character, due to the position of a certain number of female

Peucedanum (*Ferula*) *neapolitanum*.

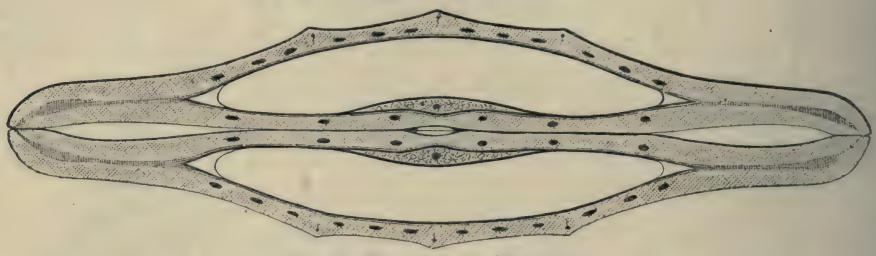

Fig. 86. Trans. sect. of fruit (♀).

flowers, sessile or with short pedicels, and disposed in no fixed order around the point whence spring at the base the secondary axes of the inflorescence. But this peculiarity is far from constant. The same is true of the woody consistence and great development of the stems, of the form and size of the leaf-divisions.[1] *Ferulago*[2] is *Ferula* whose vittæ, variable in number, often easily separate from the carpels, with the exterior coat of the fruit belonging to the receptacle.[3] They are mostly irregular, more numerous than those of the true *Ferula* and separated from each other by slightly elevated ridges. The umbels are also generally furnished with a polyphyllous involucre.

Peucedanum (*Scorodosa*) *Asa-fœtida*.

Fig. 87. Fruit (♀).

The small importance we attach to the character of the inflorescence obliges us to consider as only a section of the same genus, *Dorema* (fig.

[1] These divisions are large and more or less decurrent under the ramifications of the nervures in the leaves of *F. Narthex*, an Indian species of which has been made the genus *Narthex* (Falcon. *Trans. Linn. Soc.* xx. 285;—Balf. *Trans. Roy. Soc. Edinb.* xxii. t. 21, 22).

[2] Koch, *Nov. Act. Nat. Cur.* xii. 97.—Boiss. *Fl. Or.* ii. 996.—*? Hammatocaulis* Tausch. *Flora* (1834), 347. Boissier has enumerated (*Fl. Or.* ii. 1001, 1003) as belonging to *Ferulago* (from which, in fact, they appear inseparable), *Peucedanum nodosum* L. (*F. nodosa* Boiss.) and *F. lophoptera* Boiss. type of the genus *Uloptera* Fenzl (*Flora* [1843], 461; *Endl. Gen.* Suppl. iii. 83), in which the margin of the carpels is undulately curled; which, by concatenation, has led to be included in *Ferulago*, *Lophosciadium* DC. (*Mém. Ombell.* 57, t. 2; *Prodr.* iv. 207) considered by others (B. H. *Gen.* 905, n. 91) as a distinct genus allied to *Prangos* and *Crithmum*.

[3] Bentham and Hooker (*Gen.* 918) think that *Xanthogalum* Lallem. (*Fisch.* et *Mey. Ind. Sem. Hort. Petrop.* viii. 73), a Spanish species doubtfully referred to *Ferula lophoptera*, is perhaps

88 [1]), the umbellules of which, instead of being united in umbels, are graduated on the axes of a ramified cluster. This gives the inflorescence quite a peculiar aspect; but the fruit is, in other respects, quite that of a *Ferula* or a *Peucedan*, with solitary vittæ in the furrows, and often of very little thickness.[2]

Peucedanum (*Dorema*) *Ammoniacum.*

Fig. 88. Fruit (½).

Bubon Galbanum[3] (fig. 89), of the Cape, is also a woody *Peucedan*, whose vittæ assume a very large development, especially on the ventral face of the carpels. They may advance even to the median line which they occupy only in the herbaceous species constituting the genus *Pteroselinum*.[4] In those named *Thysselinum*,[5] they are situate deep in the pericarp; but it is quite incorrect to call them *seminal*.

The *Alvardias*[6] are *Peucedans* of tropical Africa, equally woody and shrubby, the fruit of which is more largely winged than that of *P. Galbanum*. The wings are large and thin also in the section

nearer the true Peucedans. Boissier (*Fl. Or.* ii. 985) has described as a *Ferula* of the section *Peucedanoides*, *Polycyrtus* Schlchtl (*Linnæa*, xvii. 126), which is *Elæochytris* Fenzl (*Flora* [1843]; *Ill. Pl. Syr.* 71, t. 19). De Candolle had separated *Eriosynaphe* (*Prodr.* iv. 175; *Mém. Ombell.* 50, t. 1) from *Ferula* because the commissure of the mericarps was, he thought, tomentose. It is not at all so; but on this face are three vertical salient vittæ, two of which are marginal, formed of this whitish tissue, with cellules full of gas, so common in the fruit of the *Umbelliferæ* and often called suberose. This character can form only a sectional distinction. Sometimes to *Peucedanum*, sometimes to *Ferula*, has been referred *Opoidia* Lindl. (*Bot. Reg.* [1839] *Misc.* 66) which, according to Bentham and Hooker (*Gen.* 920), is "very likely a species of *Peucedanum*, allied to *Polycyrta*," and which Boissier (*Fl. Or.* ii. 1089) still leaves among the doubtful genera, because its oval fruit, with slender vittæ solitary in the furrows of the primary ridges, has not been observed in its maturity. The genus *Ferula* belongs perhaps to N. America; as A. Gray refers to it (ex S. Wats. *Unit. St. Expl. Fortieth Parall. Bot.* 127) *Leptotænia* Nutt. (*Torr. et Gr. Fl. N.-Amer.* i. 639;—B. H. *Gen.* 922, n. 128), the fruit of which (immature) does not appear to differ from that of the Peucedans; but is said to be without vittæ at maturity.

[1] Don, *Trans. Linn. Soc.* xvi. 601; *Edinb. Phil. Mag.* ix. 46.—Endl. *Gen.* n. 4460.—Borszcz. *Mém. Acad. Pétersb.* (1860) t. 3–5.—B. H. *Gen.* 918, n. 124.—*Diserneston* Jaub. et Spach, *Ill. Pl. Or.* i. 78, t. 40.

[2] We think that *Euryangium* (Kauffm. *Mém. Soc. Nat. Mosc.* xii. [1871] 253, now recognized as a *Ferula* (Hook. f. *Bot. Mag.* t. 6196), the axes of whose inflorescence bear compound, stipitate umbels on their entire length, are intermediate between the *Peucedans* and *Dorema*.

[3] L. *Spec.* 364.—Jacq. *Hort. Vindob.* t. 36.—DC. *Prodr.* iv. 185, n. 1.—*Selinum Galbanum* Spreng. *Schult. Syst.* vi. 563.—*Agasyllis Galbanum* Spreng. *Prodr.* 22.—*Bubon* Koch, *Umbell.* 95 (not Spreng.).—*Galbanophora* Neck. *Elem.* n. 292. Bentham and Hooker refer to it *Dregea* Eckl. and Zeyh. (*Enum.* 350) and *Sciothamnus* Endl. (*Gen.* 780). At the same time they distinguish among the Peucedans of that country *Eupeucedanum* and *Cynorhiza* (Eckl. et Zeyh. *Enum.* 350).

[4] Reichb. *Fl. Germ. Exc.* 453; *Handb.* 220.

[5] Hoffm. *Umbell.* 153 (not Adans. nor Riv.).

[6] Fenzl *Flora* (1844), 312.—Endl. *Gen.* n. 4563[1].—*Steganotænia* Hochst. *Flora*, i. (1844) *Bes. Beil.* 4.

Selinoides,[1] which comprises herbaceous species, with numerous involucral bracts. The involucre is the same in *Cervaria*,[2] in which, on the other hand, the margin of the fruit is thicker and narrower. These two marginal conditions of the carpels are met with in the section *Eupeucedanum*,[3] where the involucre disappears, as in the Parsnip. In *Tommasinia*,[4] the fruit is in construction like that of the *Selinoides;* but the two wings of the same side fall off early, which gives the fruit some resemblance to that of the *Angelicas*, of which *Tommasinia* has also the foliage,[5] and which has given its name[6] to the section of the genus *Peucedanum* in which it has been ranged. The calyx is developed, like that of *Archemora*[7] and *Tiedmannia*,[8] American *Peucedans* whose fruit has rather large but contiguous wings.

Peucedanum (*Bubon*) *Galbanum.*

Fig. 89. Fruit ($\frac{4}{1}$).

Peucedanum Palimbia.

Fig. 90. Long. sect. of fruit ($\frac{8}{1}$).

Thus conceived,[9] the great genus *Peucedanum* comprises about a

[1] DC. *Prodr.* iv. 180.—*Macroselinum* SCHUR, *Enum. Pl. Transs.* 266.

[2] GÆRTN. *Fruct.* i. t. 21, fig. 10.—GAUD. *Fl. Helv.* ii. 324.—DC. *Prodr.* iv. 179.

[3] GÆRTN. *loc. cit.*—DC. *loc. cit.* 176.—It appears to us as difficult to separate generically from *Eupeucedanum* as from the *Peucedans* or even from *Ferulago*, *Palimbia* (BESS. *Enum. Pl. Volhyn.* 55.—DC. *Prodr.* iv. 175), not only the greater number of species of this genus which have been already referred to *Peucedanum* (*Palimbioidea* BOISS.), but even the type itself (fig. 90), that is *P. salsa* BESS. (*Sion salsum* L. F.—*Ferula salsa* LEDEB.—*Agasyllis salsa* SPRENG.—*Peucedanum redivivum* PALL.) which the most recent authors have preserved as a distinct genus (BOISS. *Fl. Or.* ii. 982). Its vittæ are not solitary in the furrows; which brings this plant also near most of the *Ferulas*.

[4] BERTOL. *Fl. Ital.* iii. 414. BOISSIER (*Fl. Or.* ii. 979) preserves this genus distinct, believes it identical with *Xanthogalum* LALLEM. (p. 98, note 3). *Ormosolenia* TAUSCH (*Flora* [1834], 348), approaches both this section of *Eupeucedanum* and *Pastinaca*.

[5] It is nearly the same as *Porphyroscias decursiva* MIQ. (*Ann. Mus. Lugd.-Bat.* iii. 62), the fruit of which has been compared to that of the Angelicas and which in fact much resembles it, so far as we have been able to judge from unripe specimens, but the mericarps are united at the margins before maturity and leave between them on each side a false cell, as in *Pastinaca*, &c.

[6] *Angelicoides* DC. *Prodr.* iv. 181.—*Euryptera* NUTT. *Torr. et Gr. Fl. N.-Amer.* i. 629.—*Imperatoria* KOCH, *Umb.* 95 (not of others).

[7] DC. *Prodr.* iv. 188; *Mém. Ombell.* 52.—ENDL. *Gen.* n. 4472.—TORR. *Fl. N.-York*, t. 37.—*Oxypolis* RAFIN, *Ser. Bull. Bot.* i. 217 (part).—*Neurophyllum* TORR. et GR. *Fl. N.-Amer.* i. 612.—CHAPM. *Fl. S. Un. St.* 165.

[8] DC. *Prodr.* iv. 187; *Mém.* 51, t, 12.—ENDL. *Gen.* n. 4471.—*Oxypolis* RAFIN. (part).

[9] REICHB. F. *Ic. Fl. Germ.* t. 1944–1948, 1986 (*Ferula*), 1949–1968.—SIBTH. *Fl. Græc.* t. 277;

hundred and fifty species,[1] perennial, rarely annual herbs, still more rarely shrubs or trees, inhabiting in great number the entire northern hemisphere of the old world, Africa from the Mediterranean to the Cape, and the mountainous and temperate regions of tropical western America.

Heracleum Sphondylium.

Fig. 91. Floriferous summit (½).

Heracleum is very near the *Peucedans*, particularly, as we have said, to those of the section *Pastinaca*. The leaves, like almost all the other parts of the plant, are often covered with soft or coarse hairs. The flowers (fig. 92, 93) are white and rarely yellow. The petals are generally expanded. The fruit (fig. 94) is much compressed or slightly depressed at the centre, elliptical, suborbicular, or oboval, and has its margins attenuated and drawn together till

279, 280 (*Ferula*).—Ledeb. *Ic. Fl. Ross.* t. 105, 181, 199, 305, 306, 308, 309.—Harv. and Sond. *Fl. Cap.* ii. 553, 560, n. 1 (*Bubon*), 561 (*Pastinaca*).—Boiss. *Diagn. Or.* ser. 2, ii. 88, 91 (*Ferulago*), 92 (*Ferula*); v. 98; vi. 82 (*Ferulago*), 83 (*Ferula*), 85; *Fl. Or.* ii. 982 (*Palimbia, Ferula*), 996 (*Ferulago*), 1008 (*Dorema*), 1014, 1026 (*Anethum*).—Borszcz. *Pharm. Ferul. Mém. Acad. Pétersb.* (1860) t. 1, 2; 3–5 (*Dorema*).—H. Bn. *Dict. Encycl. Sc. Méd.* ser. 4, i. 728 (*Ferulago, Ferula*).—Gren. et Godr. *Fl. de Fr.* i. 686 (*Anethum*), 687, 691 (*Ferula*), 693 (*Pastinaca*).—Walp. *Rep.* ii. 407 (*Ferula*), 408 (*Dorema*), 409, 412 (*Euryptera, Leptotænia*), 413 (*Bubon*, n. 1); v. 873 (*Uloptera*), 874 (*Ferulago*), 877 (*Ferula*), 879 (*Dorema*), 881 (*Tommasinia*), 882, 885 (*Euryptera, Xanthogalum*), 886 (*Pastinaca*); *Ann.* i. 351 (*Ferulago, Scorodosma*), 353 (*Pastinaca*); ii. 704 (*Ferulago*), 706 (*Steganotænia, Ferula*), 707; 708 (*Alvardia*), 709 (*Anethum*), 710 (*Archemora, Pastinaca*); v. 73 (*Ferula*), 74 (*Scorodosma, Dorema*), 75 (*Tæniopetalum*), 76 (*Pastinaca, Eurytænia*).

[1] With white, yellow or even pink flowers.

maturity in a thin wing corresponding to the primary lateral ridges. The three dorsal are filiform and but slightly raised, separated from each other by furrows mostly occupied by a single vitta, generally shorter than the fruit and enlarged at its inferior extremity. In *Trigonosciadum*, which in our opinion is inseparable from *Heracleum*,

Heracleum Sphondylium.

Fig. 92. Flower ($\frac{5}{1}$).

Fig. 94. Fruit.

Fig. 93. Long. sect. of flower.

the wing of the fruit is sometimes, but not constantly, a little thicker. *Heracleum* comprises biennial or oftener perennial herbs from the temperate regions of the northern hemisphere, with wide leaves often divided into lobes themselves wide ; rarely pinnate, oftener compound- or ternate-pinnate. Some of these plants inhabit Abyssinia, India and North America.

Equally near are *Malabaila* and *Opopanax*, which we cannot separate generically from each other. The former has oboval or orbicular fruit, much compressed, with solitary vittæ and thick dilated margin, smooth and formed of white tissue called suberose. *Malabaila* proper is ordinarily glabrous. They are perennial herbs with decompound pinnate leaves inhabiting the Levant, eastern Africa, and Southern Europe. To them we annex, as a section, *Zozimia*, distinguished only by the presence of a thin translucent membrane between the thickened margin of the fruit and its seminal cavity. It is a perennial downy herb, native of the Levant. *Lefebvria* with us is also a section of *Malabaila ;* it has the same oboval fruit, but the style, the branches of which are thick and attenuate at the summit, is inserted at the bottom of a very distinct hollow bounded by the two wings above. It is from tropical Western Africa. *Ana-*

lyrium, from the Cape, has the same hollow with an indistinct intramarginal circle. *Opopanax orientalis* has been rightly united to *Malabaila;* but, by the intermediation of *O. persicum*, it is inseparable from *O. chironium*, differing only by its numerous vittæ, and from *Stenotænia*, which has also two or three vittæ in each furrow, and is otherwise very near *Pastinaca* and *Heracleum*.[1]

Johrenia is scarcely more distinct from the *Peucedans*. The fruit is not so thin, and the suberose margin itself is thicker; its general form is more elliptical, and the surface of the ovary nearly glabrous, whilst *Ducrosia* has a more orbicular fruit, and the surface of the ovary is hairy. The primary ridges are suberose, tolerably thick, but on the whole not prominent. They are perennial herbs of western and temperate Asia. They also connect the *Peucedans* with *Tordylium* (fig. 95, 96), which has visible sepals, rayed petals, and a fruit often orbicular, coin-like, very compressed, with margin much thickened, whitish, nearly always rugose, more prominent than the primary ridges, which are scarcely visible. In *T. Aucheri*, of which the genus *Ormosciadium* has been made, the rugosity is more marked, and linear traces of the dorsal secondary nervures are perceptible. There are species in which the vittæ are solitary in each furrow, and others in which they are multiple. The latter is the case in *Polytænia*, which has a fruit with very thick margin and often longer relatively to its size; it is from North America. In *Condylocarpus*, the vittæ are also numerous, very close, and the central coat of the fruit is very thin. In *Hasselquistia* and *Ainsworthia*, there are fruits near

Tordylium syriacum.

Fig. 95. Fruit (⅞).

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[1] The genus *Symphyoloma* is distinguished from *Heracleum*, of which it has otherwise the fruit with marginal wings a little thicker, by two somewhat remarkable characters: the absence of vittæ and of carpophors; so that the mericarps (one of which is generally sterile) remain united to each other to the end. The plant is a perennial of the Caucasus.

the centre of the umbel with dissimilar mericarps, one becoming cuplike or urceolate with a deep concavity, while the other remains normal or becomes more or less completely abortive. Except *Polytænia*, the *Tordyliums* belong to temperate Asia and Europe and North Africa; they are nearly all annuals.

Tordylium syriacum.

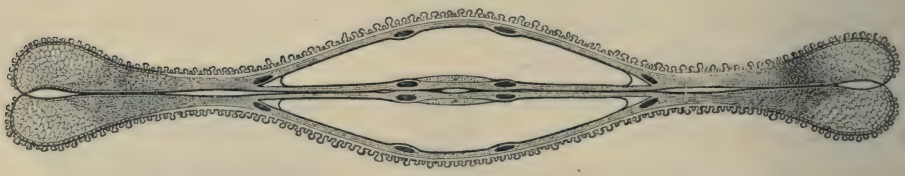

Fig. 96. Trans. sect. of fruit ($\frac{12}{1}$).

The *Angelicas* (fig. 97–99) have given this name to a small group (*Angelicæ*) referred by some authors to the series of *Peucedaneæ*, and by others to that of *Seselineæ*. With us they connect the two, as do certain other types ordinarily attributed to the *Seselineæ*. The characteristic of the latter is considered to be the earlier separation of the two corresponding margins of their carpels, whilst in the *Peucedaneæ* this separation is later. We shall see that in certain cases this is a point difficult to appreciate, and one on which the distinction of two tribes cannot be firmly based. We may mention that the same is true of the form and thickening of the mericarps, often identical in the two groups. The *Angelicas* may then be defined as *Peucedaneæ* with white or purple flowers, the petals of which are often narrowed to a short and inflexed point, and ovoid fruit, more or less compressed at the back, whose primary ridges are but little prominent, especially the lateral which form a membranous and bilamellate wing. There is one vitta in each furrow, whilst there are several in *Angelica officinalis* (fig. 99), for this reason generically distinguished under the name *Archangelica*, but which we can retain

Angelica sylvestris.

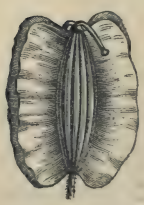

Fig. 97. Fruit.

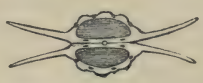

Fig. 98. Trans. sect. of fruit ($\frac{8}{1}$).

only as a section. *Levisticum* also has simple vittæ, like the true *Angelicas*, and the marginal wings of the fruit are thicker. This plant, with us will also form only a section *Levisticum* of the genus *Angelica*, thus comprising perennial herbs from the temperate regions of both worlds, with compound or decompound pinnate leaves, the segments of which are large and the involucres formed of bracts few in number, and but little developed, more numerous and narrow in *Levisticum*.

The other transition genera referred to are *Astydamia*, *Polemannia*, and *Aciphylla*. *Astydamia canariensis* is a perennial whose fruit is that of a *Peucedan*, with wide solitary vittæ in each furrow; but the mericarps have thick suberose margins which early separate from each other. The carpophore unlines itself at maturity, and the vittæ are wide and solitary in each furrow. The seeds have a flat or slightly concave surface. The embryo, with long lanceolate cotyledons, occupies about half the length of the albumen. *Polemannia* consists of types with small somewhat rounded fruit. The margin is thick and almost fleshy, and the base of the mericarp is decurrent on the pedicel. They are Cape shrubs whose full inflorescence bears simple lateral

Angelica Archangelica.

Fig. 99. Flowering summit ($\frac{1}{4}$).

umbels and one compound terminal umbel. *Aciphylla* represents a genus somewhat heterogeneous, particularly as to habit. Some species in their foliage resemble the *Gramineæ*, *Eryngium*, *Pyrus*, *Rosa;* others again *Spiræa*. The flowers are generally polygamo-diœcious, and the oblong fruit perhaps similar to that of the preceding genera, a little less compressed parallel to the partition. The primary ridges may all be but little prominent, or more or less developed into wings, sometimes the marginal, or the dorsal, or the two intermediate, or several at once, with many variations according to the species. In each furrow are one or several vittæ, and this character varies in species otherwise closely allied. The true *Aciphyllas* are from Australia and New Zealand. *Anesorhiza* and *Thaspium*, which we annex to them as sections, and which may have exactly the same fruit, grow, the one at the Cape, the other in North America.

The first *Aciphyllas* known were referred to the closely allied genus

Meum (*Eumeum*) *athamanthicum*.

Fig. 100. Fruit (4/1).

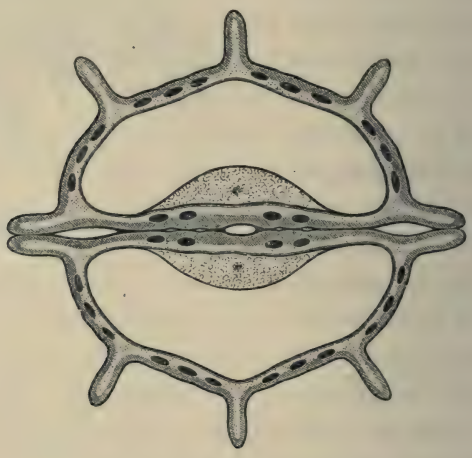

Fig. 101. Trans. sect. of fruit (12/1).

Ligusticum, inseparable from *Meum*, a name entitled to priority. The type is *M. athamanticum* (fig. 100, 101), a perennial herb of temperate Europe, having an oval oblong fruit, compressed parallel to the partition, and seeds with nearly flat slightly or more deeply concave

face. The vittæ are indefinite in number. The involucres are nil or reduced to a small number of bracts, and the bracteoles of the involucel are variable, often inconsiderable, in number, and narrow, setaceous. To this genus as sections we refer: *Bonannia*, whose fruit, rather more compressed, has seeds with flat face, vittæ indefinite in number, often slightly marked, and whose involucres and involucels are formed of short bracts; *Silaus*, having the fruit of *Meum athamanticum*, with indistinct vittæ, very fine, or very wide, though very thin on the facial side, involucres and involucels similar to those of *Meum*; *Ligusticum* (fig. 102) whose vittæ are numerous, sometimes indistinct, and whose fruit has a flat or slightly concave face; *Schultzia*, having the fruit of *Ligusticum* with well developed involucres and involucels of entire or divided bracts; *Siler*, whose fruit similar to that of *Ligusticum*, has solitary vittæ; the involucres and involucels are similar to those of *Meum*; *Pleurospermum*, whose vittæ are solitary or geminate, and whose seeds have a flat or more or less concave face; the bracts of the involucre and involucels are entire or divided, nearly like those of *Schultzia*; *Cyathoselinum*, having the fruit of *Ligusticum*, but the bracts of the involucel united at the base, as in certain *Seseli*; *Trochiscanthes*, whose fruit is that of *Meum*, with numerous vittæ, but the umbels are united in a sort of ramified and verticillate cluster; the petals have an elongate claw; finally *Selinum* and *Cortia*, having the fruit of *Meum* or *Ligusticum*, rather short, solitary vittæ in each furrow, and marginal ridges developed into rather wider wings. In *Cortia*, Indian herbs, having the latero-dorsal ridges more developed

Meum (*Ligusticum*) *alatum*.

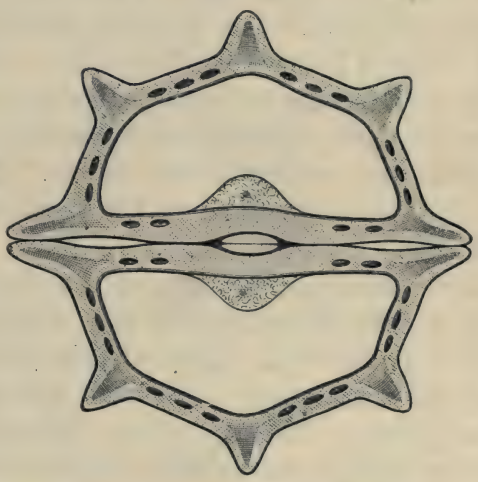

Fig. 102. Trans. sect. of fruit (4).

at the base, the bracts of the involucre are rather large, frequently lobed; and in *Selinum*, inhabiting temperate Europe and Asia, the Cape (and perhaps, it is said, the Andes of Columbia), the involucres and involucels much resemble those of *Meum*. The bulk of the genus belong chiefly to the temperate regions of the northern hemisphere of the old world.[1]

Capnophyllum, annuals of the Mediterranean region and southern and western Africa, has fruit with much compressed and elliptic-oblong mericarps; the primary ridges are prominent, entire or tubercular, especially the marginal, which form thick but not wide wings. The bracts of the involucres and involucels are sometimes narrow and sometimes membranous or nearly scarious. The face of the seeds is flat, whilst it is curved in *Diplotænia*, often referred to the *Peucedans* or *Ferulas*, but the fruit, much thicker and rounded at the back, with obtuse margins, has considerable resemblance to that of *Pleurospermum*. The vittæ are solitary in each furrow. They are perennial plants of the Levant, whose habit and inflorescence closely approaches those of *Ferula*.

In *Cymbocarpum*, annuals of the Caucasus, the fruit approaches that of *Selinum*, but it is small, wingless, the carpels being only thinned at the edge. They are thin and deeply concave within, as is also the compressed seed, and the glabrous back bears three inconspicuous filiform ridges, between which are interposed furrows with solitary vittæ. The compound umbels have involucres and involucels formed of bracts ordinarily narrow, more rarely foliaceous.

Œnanthe (fig. 103, 104) has fruit slightly compressed from front to back or with a nearly circular transverse section. The mericarps generally separate at maturity; but in the true *Œnanthes* there is no carpophore, or it is rudimentary and inseparable from the rest of the fruit. The most remarkable character presented is the considerable development of the whitish tissue, called suberose, which consists of cellules full of gas and occupies particular regions. It forms a thick

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[1] *Polyzygus*, an Indian herb, having the habit of *Pimpinella*, appears allied to the preceding plants. It has a tuberous rhizome (?) scarcely developed, and ovoid fruit, little compressed, slightly attenuated at the summit, with two or three vittæ in each furrow; but its fruit has not yet been examined when completely ripe.

vertical column at each primary ridge especially the marginal. With these columns alternate as many vittæ, more interior, and there are two or four corresponding to each half of the very wide commissure. The ovary and the fruit are surmounted by conical often elongate stylopods, and moderately developed pointed persistent sepals. The face of the seed is flat or traversed, like the rest of its surface, with vertical channels, marked with prominent vittæ. *Œnanthes* are found in all parts of the old world.

Œnanthe crocata.

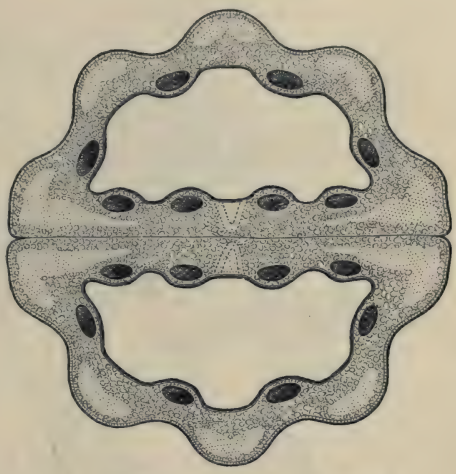

Fig. 103. Trans. sect. of fruit (½).

They are often aquatic herbs, with compound umbels, furnished with numerous bracts, or with only one, or with none. The leaves may be reduced to a rounded petiole as is constantly the case in *Crantzia*, a small herb found in the two Americas, New Zealand and Australia, having the flowers and fruit of *Œnanthe* but in simple umbels, which will characterize it as a section. In *Œ. nodiflora*, a Marocco species, the fruit is that of *Œnanthe*, but it has a simple or double carpophore, characteristic of a section *Sclerosciadium*, also raised to the rank of a genus, as have likewise been three American types, *Cynosciadum*, *Discopleura* and *Eurytænia*. In the first the petals are entire or nearly so, orbicular, concave; the column is ordinarily simple. The second has a simple or double column, pointed or very slightly developed petals, and the marginal ridges of the fruit are angular. In the third they are dilated to short wings; and as they are arranged in pairs they may be considered as connecting the preceding types with certain sections of *Peucedanum*.

Œnanthe Phellandrium.

Fig. 104. Fruit (½).

The lesser Hemlock or Fool's Parsley alone represents the genus *Æthusa* (fig. 105–108). The flowers have no calyx, five petals,

Æthusa Cynapium.

Fig. 105. Floriferous branch ($\frac{1}{2}$).

very unequal at the circumference of the umbels, large and depressed stylopods. The fruit is ovoid, short or nearly globular, with an

almost circular transverse section. The primary ridges project in the form of whitish prismatic columns; the marginal are a little more prominent. The vittæ are thin and solitary, and the ridges may contain some rudimentary ones; the slender carpophore is bipartite; the face of the seed flat. *Æthusa* is an annual of Europe and Northern Asia, with a fetid odour and decompound and ternatipinnate leaves. Its compound, terminal and oppositifolious umbels have involucres formed of a single or of a very few bracts (which may be completely wanting), and involucels formed of a few (often three) pointed setiform bracteoles

Æthusa Cynapium.

Fig. 106. Long. sect. of flower (♀).

Æthusa Cynapium.

Fig. 107. Fruit (♀).

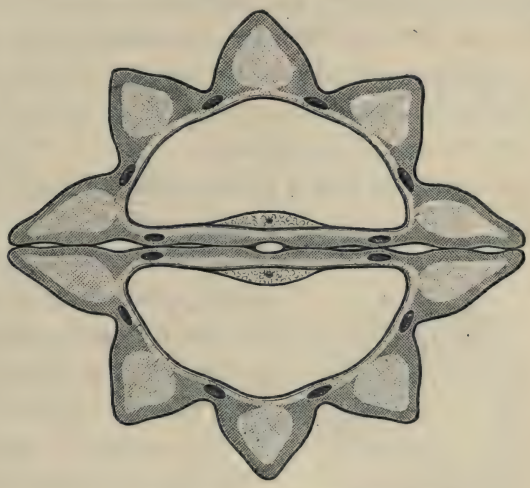

Fig. 108. Trans. sect. of fruit (♀).

situated at the outer side of the inflorescence and descending to disappear at a certain stage.

Crithmum maritimum (fig. 109, 110), a perennial, glabrous herb, common on the sea shores of Europe, the Mediterranean and the

north-western African isles, has a fruit resembling that of *Æthusa*, larger and a little more compressed. Not only the five angular ridges of each mericarp, but also the greater part of its thickness, consist of suberose tissue (here light and porous). The vittæ,

Crithmum maritimum.

Fig. 109. Fruit (⁶/₁).

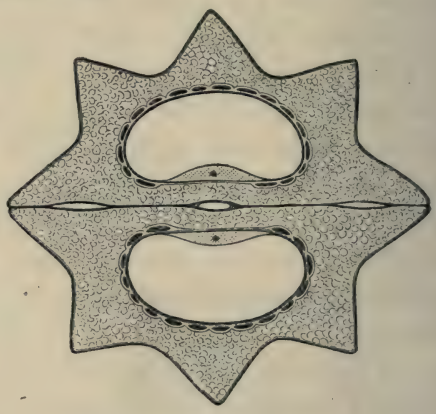

Fig. 110. Trans. sect. of fruit (¹²/₁).

indefinite in number, are confined to the deep bed of the endocarp, and are so exactly fitted to the seed that (though not belonging to it) they remain attached on the separation of the pericarp. *Crithmum* has fleshy decompound-ternatipinnate leaves, and numerous bracts in its involucres and involucels.

Phellopterus is also a littoral plant found in Japan, the Corea and the Loo-choo isles. It is a pilose herb with large dentelate leaf-segments. Its fruit, nearly pear-shaped, has a transverse section in form nearly that of *Crithmum*. The primary ridges are dilated to thick wedge-like wings and the numerous vittæ also fit to the seed, the face of which is concave. The flowers, united in compound umbels, bristle with hairs and have subulate unequally elongate sepals.

Pappea capensis.

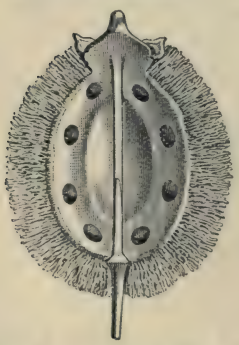

Fig. 111. Ventral face of mericarp (⁶/₁).

Here are somewhat doubtfully placed two abnormal monotypic genera, very different from each other: *Pappea* and *Thecocarpus*. The former (fig. 111) is a small herbaceous plant from the Cape of

Good Hope, not a little resembling a *Fumariea*, whose small irregularly compound umbels bear flowers with a somewhat irregular corolla succeeded by a small oval fruit, much compressed parallel to the partition. The three dorsal primary ridges are linear and indistinct; the marginal are dilated to a narrow wing on which the vittæ are represented by small orbicular reservoirs filled with an oily resinous substance. *Theocarpus* (fig. 112) is a perennial plant from the Levant, the external characters of which bear some resemblance to those of *Echinophora*, near which it has sometimes been placed. Its ovoid fruit with a nearly circular transverse section, is surrounded by the accrescent bracts of the involucel, hardened or spinescent, and connate with the pedicels of the peripheric flowers which remain sterile.

Theocarpus meifolius.

Fig. 112. Fruit (4/1).

Cachrys (fig. 113) has given its name to a subseries which in many respects approaches several others, and is characterized by a fruit, ordinarily large for this family, hard, nearly round or more or less compressed parallel to the partition, sometimes having angles or salient wings, with indistinct vittæ, often indefinite in number, applied to the seed the face of which is much hollowed, with induplicate or involute edges. The mericarp finally assumes a suberose consistence. In the true *Cachrys*, it is very thick, smooth, and without projections on its surface. In those of the section *Prangos*, the primary ridges or some of them are dilated to a wing. *C. goniocarpa* and some other species are intermediate in that their mericarps have five slightly prominent angles. In *C. sicula*, placed in the genus *Hippomarathrum*, these angles

Cachrys goniocarpa.

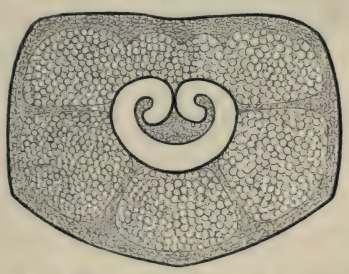

Fig. 113. Trans. sect. of mericarp (3/1).

correspond to so many lobes separated from each other by rather deep and vertical furrows. In *Colladonia*, especially in those named *Meliocarpus*, the transverse section of the carpels is pentagonal; but, further, the wings are prolonged inferiorly, towards the pedicel, in vertical laminæ more or less developed. Very generally the suberose tissue of the mesocarp divides longitudinally into parts corresponding in number to the primary ridges. All these plants are erect perennial with decompound pinnate leaves, and the involucres and involucels are formed of numerous bracts, often short. The fruit is covered with down, rigid in those called *Magydaris*. This genus grows in the Mediterranean region, in the Levant, in Asia Minor, and in north-western Africa, especially in the islands near the coast.

In *Fœniculum* or Fennel (fig. 114), the oblong fruit with nearly round transverse section, resembles that of *Anethum* (with which it was formerly generically united); but it is much more elongate, and the marginal ridges are much less developed. The other primary ridges are tolerably thick but short. The secondary ridges are indicated each by a slightly prominent vitta. These vittæ are, moreover, marked on the furrows of the seed, the face of which is flat or slightly concave. The sepals are not developed, and the inflorescence is a compound umbel without involucre or involucels. The Fennels are erect perennial, or biennial herbs, very odorous, having decompound pinnate leaves with linear divisions, and entire or involute yellow petals.

Fœniculum vulgare.

Fig. 114. Fruit ($\frac{5}{1}$).

The Fennels connect such genera as *Meum*, *Diplotænia*, and *Œnanthe* with *Seseli* (fig. 115, 116), which has given its name to a tribe (*Seselineæ*). They have a tubular or ovoid receptacle, the margin of which bears five tolerably developed subulate sepals, and five equal, or nearly so, valvate or slightly imbricate petals, with pointed and inflexed summit, inserted like the stamens, below the sinuous or crenelate margin of the conical stylopod which encases the base of the reflexed often capitate, stylary branches. The fruit

is, on transverse section, circular or slightly compressed parallel to the commissure, flat or slightly concave, and has five prominent primary ridges, equal or nearly so, prismatic or rather obtuse. Each furrow contains one vitta, rarely two, and sometimes also each primary ridge has one finer. Very prominent in the interior of the pericarp, the vittæ are moulded on the seed, which becomes longitudinally channelled and the face of which is flat or traversed by a

Seseli gummiferum.

Fig. 115. Long. sect. of flower (§).

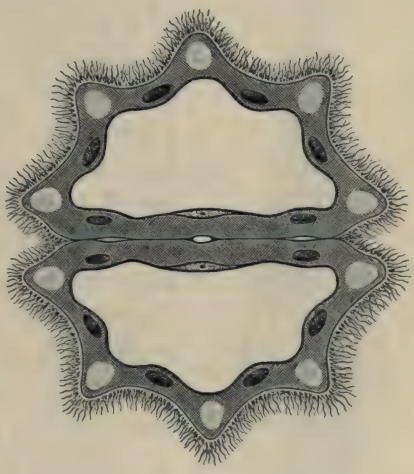

Fig. 116. Trans. sect. of fruit (§).

slight vertical furrow. *Bubon macedonicum* is a *Seseli* with bristly fruit and fine vittæ under its primary ridges. This genus comprises perennial or biennial herbs, with compound umbels. In the true *Seseli*, the involucre is nil or formed of a small number of bracts, and the bracteoles of the involucels are free or scarcely united at the base. In *Libanotis*, the involucres, like the involucels, are formed of numerous bracts. In *Hippomarathroides*, another section of the genus, there is no involucre; but the bracts of the involucels are generally united to a considerable extent in a sort of cupule. *Seseli* inhabits chiefly the temperate regions of the northern hemisphere of the old world; but it is found, in smaller number, in Australia and North America. We must refer to this genus as sections: *Cachrys abyssinica*, of which a genus *Diplolophium* has been made, and which has, with a peculiar habit, an involucel with large bracts nearly free and a seed slightly concave within; *Portenschlagia*, a Dalmatic plant,

also having a seed slightly concave within and the wide vittæ of which more or less raise the tissue of the furrows between the secondary ridges; *Todaroa*, a plant of the Canary isles, whose fruit is distinguished, as in several other genera, by the greater development of its marginal ridges; and *Angelica scabra*, a perennial herb of the eastern Pyrenees, type of a genus *Xatardia*, the habit of which is somewhat peculiar, but it has the fruit of *Seseli*, except that the primary ridges are thicker, obtuse, and formed of suberose tissue of a whitish colour.[1]

Athamantha Matthioli.

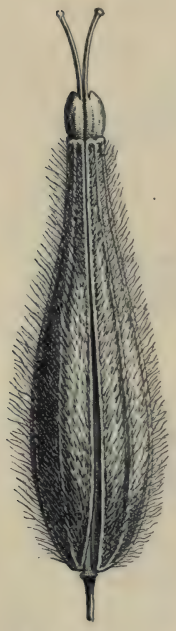

Fig. 117. Fruit (§).

Athamantha resembles *Seseli* on the one hand and several types of the following series on the other. It has oblong fruit with a transverse section nearly circular or slightly compressed parallel to the partition. The stylopods are thick, variable in form, and the face of the seed is nearly flat, more rarely traversed by a slight vertical furrow, in the species quite typical of the genus such as *A. Matthioli* (fig. 117). The vittæ are solitary in each furrow, and there are sometimes more slender ones under the primary ridges. In *A. cretensis*, type of a genus *Petrocarvi*, the seed is slightly concave within. In *Tinguarra* it is much more concave; on which ground they are made a section of the genus *Athamantha*. They have also been distinguished by the number of their vittæ, said to be indefinite. If this character is true for *T. sicula*, it is not always so for certain other species, as *T. cervariæfolia*, where we find only solitary vittæ. *Kundmannia* appears to us also an *Athamantha* with a fruit somewhat obtuse at the summit, hard ridges and fine vittæ, very variable in number, ordinarily anastomose between them near the extremities.

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[1] With some hesitation we place near *Seseli* the two imperfectly known genera, *Sclerochorton* and *Haussknechtia*, both from the Levant. The former, with a slightly compressed fruit, has a concave seed-face, numerous sinuous bandlets, and a female flower sessile in the centre of the umbellule, which is surrounded by sterile rays. The latter, the fruit of which is unknown, has nearly the inflorescence of a *Dorema*, with bracteoles united in a cuplike involucre and a laterally compressed ovary, with an interlocular partition hollowed with resiniferous chambers. The umbels are compound though very shortly stipitate.

This genus consists of perennial herbs of Europe, especially of the Mediterranean region, of Western Asia and the Canary isles.

IV. THE CARAWAY SERIES.

The Caraways[1] (*Carum*) are *umbelliferæ* with hermaphrodite or polygamous flowers, regular in the middle of the inflorescence, irregular in the corolla at the circumference, in fact organized like those

Carum Carui.

Fig. 118. Fruit (½).

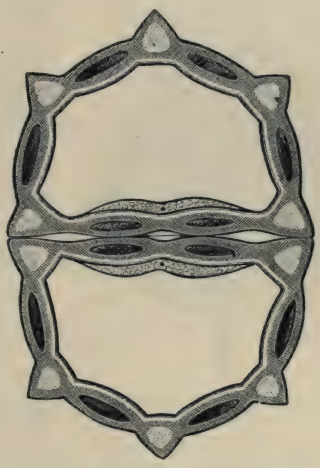

Fig. 119. Trans. sect. of fruit.

of the Carrots or Peucedans. But the receptacle, sacciform with narrow opening, is, both in the flower and in the fruit of *C. Carui*[2] (fig. 118, 119), the species best known, oblong and laterally compressed, that is perpendicular to the partition separating the cells. The two mericarps are glabrous, pentagonal, with five equal, obtuse, slightly prominent primary ridges. The marginal ridges touch the corresponding ones of the other carpel, and there is only a slight

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[1] T. *Inst.* 306, t. 160.—*Carum* L. *Gen.* n. 365.—J. *Gen.* 219.—Koch, *Umbell.* 121.—DC. *Mem.* 41; *Prodr.* iv. 114.—Spach, *Suit. à Buffon*, viii. 193.—Endl. *Gen.* n. 4406.—B. H. *Gen.* 890, n. 56.—H. Bn. *Adansonia*, xii. 176.—Hook. *Fl. Ind.* ii. 680.—*Careum* Adans. *Fam. Pl.* ii. 95.

[2] L. *Spec.* 378.—*Seseli Carvi* Lamk. *Fl. Fr.* iii. 435; *Ill.* t. 202, fig. 3.—*Seseli Carvi* Scop. *Fl. Carn.* ed. 2, n. 361.—*Apium Carvi* Crantz, *Fl. Austr.* 218.—*Bunium Carvi* Bieb. *Fl. Taur-Cauc.* i. 211.—*Ligusticum Carvi* Roth, *Fl. Germ.* i. 124.

depression between them. Each furrow has a solitary vitta and the commissure has one on each side. A carpophore, bifurcate to a variable extent, bears the mericarps. The seed is slightly compressed at the sides, channeled, and its face is flat or traversed by a furrow or a salient ridge along the median line. *C. Carui* and its allied species [1] are annual or perennial herbaceous plants, with pinnate or decompound ternatipinnate leaves. The involucres of the umbels, sometimes a little irregular, are formed of a few bracts, or sometimes nil; the bracteoles of the involucels are indefinite in number.

Carum Petroselinum.

Fig. 120. Fruit ($\frac{8}{1}$).

Some annual species of *Carum* have bifid petals, furnished with a transverse median fold whence proceeds a small tongue or lobule; of them has been made a genus *Ptychotis*.[2] Others, as the common Parsley (fig. 120), annuals or biennials, have a little shorter glabrous fruit and yellowish or greenish flowers; they constitute the genera *Petroselinum*,[3] *Wydleria*,[4] and *Ridolfia*.[5] *Trachyspermum*[6] consists of annual or biennial *Ptychosis* with fruit covered with papillæ or hairs. In *Brachyapium*[7] the fruit is shorter than in the preceding species and quite double; in *Trachysciadium*,[8] it is rather more elongate and hispid. In *Microsciadium*,[9] it is also elongate and narrower, with more prominent ridges, and the stylopods irregularly concave; this type is rendered inseparable from *Carum* by the intervention of *Falcaria*[10] *Rivini*, which has nearly the same disk and rather more developed sepals, but otherwise all the essential characters of *Carum*.[11]

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[1] Sect. *Eucarum*.—Sect. *Carvi* DC. *Prodr.* iv. 115.—*Selinopsis* Coss. et Dur. *Pl. Exs. Alger.*—*Careum* Adans. (ex DC.).

[2] Koch, *Umbell.* 124 (1822).—DC. *Mém.* 39; *Prodr.* iv. 107.—Endl. *Gen.* n. 4400.—*Ammoides* Adans. *Fam. des Pl.* ii. (1763) 96 (ex. DC.).—*Bunium* Lag. *Ann.* ii. 104 (ex DC.).

[3] Hoffm. *Umbell.* i. 78, t. 1.—Koch, *Umbell.* 127.—Lag. *Ann.* ii. 102.—DC. *Prodr.* iv. 102.—Endl. *Gen.* n. 4394.

[4] DC. *Mém.* 36, t. 7; *Prodr.* iv. 103.—Endl. *Gen.* n. 4395.

[5] Mor. *Fl. Sard.* ii. 212, t. 75.

[6] Link. *Enum. Hort. Berol.* i. 267.

[7] The type of this section is, with us, *Ptychotis didyma* Sond. (*Fl. Cap.* ii. 538).

[8] Eckl. et Zeyh. *Enum. Afr. Austr.* 341.

[9] Boiss. *Ann. Sc. Nat.* ser. 3, i. 141; *Fl. Or.* ii. 890.—B. H. *Gen.* 892, n. 58.

[10] Riv.—Host, *Fl. Austr.* i. 381 (not Cav.).—DC. *Prodr.* iv. 109.—B. H. *Gen.* 892, n. 59.—*Prionitis* Delarb. *Fl. d'Auv.* 421.—*Drepanophyllum* Hoffm. (ex part), *Umb.* 109 (not A. Rich.).—*Crithamus* Bess. *En. Volh.* 93 (not Hoffm.).—Endl. *Gen.* n. 4401.—*Hladnickia* Reichb. *Fl. Germ.* 476; *Icon.* fig. 1114 (not Koch).

[11] We think we may refer to this genus as a

There are some *Carums* whose vittæ are occasionally geminated in the furrows.[1] These species hereby connect themselves with *Petrosciadium*,[2] more generally referred to the genus *Pimpinella*, and may have in each furrow one, two or three vittæ, sometimes more or less connected. *Pimpinella*[3] proper (fig. 121) differs from the true *Carum* only in the multiplicity of vittæ; a character of no more value here than elsewhere. Proof of this may be found in the fruit of the Goutweeds (*Ægopodium*[4]), species of *Pimpinella* and *Carum* considered as having no vittæ, but often possessing rudiments of them more or less incomplete and irregular.

Carum (*Pimpinella*) *Anisum*.

Fig. 121. Fruit (§).

Bunium[5] is also among those plants which intimately connect *Carum* with *Pimpinella*. Those called *Bunioides*[6] have numerous vittæ, and thereby are connected with the latter. Those, on the other hand, as *Bulbocastanum*,[7] which have solitary vittæ in each furrow, approach much nearer to *Carum* proper. *Elvendia*[8] is inseparable from the *Buniums* with solitary vittæ, as is also *Huetia*,[9] whose seed is rather more concave within,

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near section of *Falcaria*, *Lomatocarum* Fisch. et Mey (*Ind. Sem. Hort. Petrop.* vi. 59), included with *Selinum* by Bentham and Hooker (*Gen.* 914), and differs from the Caraways only in the length of the fruit. The vittæ are solitary. Notwithstanding its peculiar habit, we refer to these types as a section *Apium Popei* A. Gray, which has been distinguished as a genus under the name of *Ammoselinum* (Torr. et Gr. *Exp. Pope Rep. Bot.* 165.—B. H. *Gen.* 1009, n. 71 *a*). It is an annual of western Texas, with decompound leaves, a fruit rather more elongate than those of *Apium* generally, with solitary vittæ and a carpophore often bipartite. On each side of the face of the mericarp is a vertical thickening of whitish suberose tissue. The stylopods are short and the petals entire.

[1] Or even ternate. Such are *C. rupestre*, *græcum*, *multiflorum*, *Heldreichii*, &c.

[2] Edgew. *Trans. Linn. Soc.* xx. 51.—B. H. *Gen.* 895.

[3] L. *Gen.* n. 366 (not T. nor Gærtn.).—Koch, *Umb.* 120, fig. 65, 66.—DC. *Mém.* 42; *Prodr.* iv. 119.—Endl. *Gen.* n. 4410.—B. H. *Gen.* 893, n. 62.—Hook. *Fl. Ind.* ii. 684.

[4] L. *Gen.* n. 368.—Hoffm. *Umb.* 82.—Koch, *Umb.* 122.—DC. *Prodr.* iv. 114.—Endl. *Gen.* n. 4405.—B. H. *Gen.* 893, n. 61.—*Podagraria* Riv. *Pentap.* t. 47.—Mœnch. *Meth.* 89.—Lob. *Icon.* t. 700, fig. 2.

[5] L. *Gen.* n. 335 (part).—DC. *Prodr.* iv. 115 (part).—Endl. *Gen.* n. 4407 (part).

[6] B. H. *Gen.* 894.—*Bunium* Koch, *Syn. Fl. Germ.* ed. 2, 315 (not L.).—DC. *Prodr.* iv. 15 (part).

[7] Schur, *Enum. Pl. Trans.* 249 (not Lag.).

[8] Boiss. *Ann. Sc. Nat.* ser. 3, i. 140.

[9] Boiss. *Diagn. Or.* ser. 2, ii. 103; *Fl. Or.* ii. 897.—Sibth. et Sm. *Fl. Græc.* iii. 67, t. 274 (*Freyera*). *Geocaryum* (Coss. et Dur. *Pl. Nouv. et Crit. d'Esp.* 112) has the seeds of *Carum*, with narrow conical stylopods and ought to be referred to this last genus (B. H. *Gen.* 891).

and the stylopods rather more elongate. *Atœnia*[1] and *Edosmia*[2] are American *Carums* with a tuberous root or rhizome, the fruit of which, with wide but not thick vittæ often scarcely visible, in this respect much resembles that of the Goutweeds.[3]

The old genus *Zizia*,[4] from North America, is also one of those which cannot be dismembered holding both to *Pimpinella* and to *Carum*: to the latter by those species with solitary vittæ; to the former by *Z. integerrima* (*Zizioides*), whose vittæ are numerous like those of *Cryptotœnia*,[5] a perennial herb, of the same genus and from the same country, with oblong fruit somewhat narrowed at the level of the commissure. Many other types with geminate vittæ or nearly always in greater number, cannot be separated generically from *Pimpinella*. Such are: *Acronema*,[6] an annual of India with very thin vittæ; *Reutera*,[7] an annual or perennial herb of the Levant, differing only in yellow petals entire or nearly so at the summit and convolute; *Tragium*,[8] which, with white petals, has a fruit covered with hairs or papillæ,[9] like that of *Trachyspermum*; *Pituranthos*[10] or *Deverra*,[11] having also a hairy fruit, but very thin solitary vittæ; *Gymnosciadium*,[12] an Abyssinian plant, having the characters of *Tragium*, but with glabrous fruit.

Thereby this plant connects with the preceding sections *Tragoselinum*,[13] perennial, rarely annual, species, with pinnate or decompound leaves, sometimes undivided or simply dentate, of which several, as *P. Saxifraga*, *caruifolia* and *magna*, are common in Europe.

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[1] Hook. and Arn. *Beech. Voy. Bot.* 349.

[2] Nutt. *Torr. et Gr. Fl. Bor.-Amer.* i. 612.

[3] *Sympodium simplex* Koch (*Linnœa*, xvi. 336), is only a variety of *C. elegans* Fenzl (Boiss. *Fl. Or.* ii. 884). *Chamarea* Eckl. et Zeyh. (*Enum.* 346) is *C. capense* Sond. (*Fl. Cap.* ii. 538).

[4] Koch, *Umbell.* 129. — DC. *Prodr.* iv. 99 (leaves often cordate, entire or dentate).—Endl. *Gen.* n. 4392.

[5] DC. *Mém.* 42; *Prodr.* iv. 108.—Endl. *Gen.* n. 4409.—B. H. *Gen.* 896, n. 65.—*? Alacospermum* Neck. *Elem.* n. 276 (ex DC.).—*Cyrtospermum* Rafin (ex Endl.).

[6] Edgew. *Trans. Linn. Soc.* xx. 51.

[7] Boiss. *Elench.* 46; *Voy. Esp.* 242, t. 69, 70; *Fl. Or.* ii. 861.

[8] Spreng. *Umbell. Prodr.* 26. — *Ledeburia* Link, *Enum. Hort. Berol.* i. 286.

[9] It is the same in *Pimpinella eriocarpa* (Russ. *Alepp.* ii. 249), type of the genus *Chesneya* Bertol. (*Misc.* i. 17, t. 11) or *Gaytania* Munt. (*Bot. Zeit.* [1843] 730). *Anisum* Eckl. et Zeyh. (*Enum.* 341) is *Pimpinella stadensis* Harv. and Sond. (*Fl. Cap.* ii. 538) the ovary and fruit of which are also covered with hairs.

[10] Viv. *Fl. Lib.* 15, t. 7 (1824).—B. H. *Gen.* 890, n. 54.—Hook. *Fl. Ind.* ii. 679.—*Eriocycla* Lindl. *Royle Ill. Himal.* 232, t. 51.

[11] DC. *Mém.* 45; *Prodr.* iv. 143 (1830).—Boiss. *Fl. Or.* ii. 860.

[12] Hochst. *Flora* (1844), 20.

[13] T. *Inst.* 309, t. 163.—Mœnch, *Meth.* 99.—DC. *Prodr.* iv. 119 (*Pimpinella*, sect. 1).

Sisarum[1] differs from this section only in the more or less considerable development of the involucre.[2]

We refer also to this genus as simple sections: *Muretia*,[3] which is Asiatic, and has a short fruit of *Pimpinella*, stylopods the union of which forms a sort of dome, a fruit with nearly circular transverse section and a seed with more or less concave face;[4] *Chamæsciadium*,[5] Siberian plants whose compound umbels have the principal axis short, so that the umbellules supported by long radii appear at first sight as simple umbels; the fruit is quite that of a *Carum*, with the numerous vittæ of *Pimpinella*, the stylopods are little developed; *Panulia*,[6] whose fruit, analogous to that of the Caraway, often (but not constantly) has more prominent ridges and numerous vittæ; it inhabits Chili; *Lereschia*,[7] a genus proposed for *Cryptotænia Thomasii*,[8] a Neapolitan species with small stylopods and loose irregular inflorescence; and *Petrosciadium*,[9] Asiatic plants which, with the characters of *Tragium*, have in each furrow one, two, or rarely a larger number of vittæ.

Thus understood,[10] this great genus comprises about a hundred and forty species,[11] and belongs to all the temperate regions of both

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[1] Tausch, *Flora* (1834), 355. It is *Sium Sisarum* L. (*Spec.* 361;—DC. *Prodr.* iv. 124, n. 1).

[2] Bentham and Hooker (*Gen.* 1008) think that *Pancicia* (Vis. *Pl. Serb. Pempt.* 4, t. 1) might well be a *Pimpinella* with involucre formed of well-developed bracts.

[3] Boiss. *Ann. Sc. Nat.* ser. 3, i. 143; *Fl. Or.* ii. 858.—B. H. *Gen.* 895, n. 63.

[4] As it is also in that of *Ridolfia segetum*.

[5] C. A. Mey. *Verz. Cauc. Pfl.* 122.—Endl. *Gen.* n. 4408.—B. H. *Gen.* 895, n. 63.

[6] The type of which is *Ligusticum Panul* Clos, *C. Gay Fl. Chil.* iii. 131 (*L. Pansil* DC. *Prodr.* iv. 669) and to which perhaps are referable (B. H.) the other Chilian species of *Ligusticum* of Clos (Phil. *Linnæa*, xxxiii. 94).

[7] Boiss. *Ann. Sc. Nat.* ser. 3, 1, 127.

[8] DC. *Prodr.* iv. 119, n. 2.

[9] Edgew. *Trans. Linn. Soc.* xx. 51.—? *Anisometros* Hassk. *Flora* (1847), 601.—*Murrithia* Zoll. *Nat. und Gen. Arch. Neerl. Ind.* ii. 576.—*Heterachæna* Zoll. *l.c. cit.* 577.

[10] To the twelve sections admitted (B. H.): 1, *Bunioides*. 2, *Tragoselinum*. 3, *Reutera*. 4, *Tragium*. 5, *Petrosciadium*. 6, *Zizioides*. 7, *Zizia*. 8, *Petroselinum*. 9, *Trachyspermum*. 10, *Edosmia*. 11, *Bunium*. 12, *Eucarum* (*Carvi*), we add,—13, *Panulia*. 14, *Pituranthos*. 15, *Brachyapium*. 16, *Ammoselinum*. 17, *Microsciadium*. 18, *Cryptotænia*. 19, *Falcaria*. 20, *Chamæsciadium*. 21, *Muretia*. 22? *Pancicia*.

[11] Boiss. *Diagn. Or.* ser. 2, ii. 73 (*Pimpinella*), 77; vi. 78 (*Pimpinella*); *Fl. Or.* ii. 857 (*Petroselinum*), 858 (*Ridolfia*, *Muretia*), 859 (*Chamæsciadium*), 860 (*Deverra*), 861 (*Reutera*), 864 (*Pimpinella*), 878 (*Carum*), 889 (*Podagraria*), 890 (*Ptychotis*, *Microsciadium*), 892 (*Falcaria*).—Harv. and Sond. *Fl. Cap.* ii. 535 (*Petroselinum*) 536 (*Ptychotis*), 538 (*Carum*, *Pimpinella*), 548 (*Deverra*).—Clos, *C. Gay Fl. Chil.* iii. 121 (*Petroselinum*, *Wydleria*), 130 (*Ligusticum*).—A. Gray, *Man.* (ed. 5) 195 (*Zizia*), 197 (*Cryptotænia*).—S. Wats. *Un. St. Expl. Fort. Parall. Bot.* 121 (*Edosmia*, *Pimpinella*).—Chapm. *Fl. S. Un. St.* 161 (*Cryptotænia*), 163 (*Zizia*).—Spach, *Suit. à Buffon*, viii. 195 (*Ægopodium*), 197 (*Pimpinella*).—Gren. et Godr. *Fl. de Fr.* i. 727 (*Pimpinella*), 729 (*Bunium*), 731 (*Ægopodium*), 733 (*Falcaria*, *Ptychotis*), 738 (*Petroselinum*).—Walp. *Rep.* ii. 391 (*Petroselinum*, *Wydleria*), 392 (*Ptychotis*, *Ægopodium*), 393 (*Carum*, *Lomatocarum*, *Bunium*), 394 (*Sympodium*, *Chamæsciadium*), 395 (*Pimpinella*, *Reutera*), 396 (*Ridolfia*); v. 848 (*Gymnosciadium*, *Petroselinum*), 849 (*Microsciadium*), 850 (*Ægopodium*,

worlds; it exists also in sub-tropical countries, in Southern and Eastern Africa, in India, in the two Americas. They are annual, biennial, or perennial herbs. The leaves are pinnate, decompound pinnate or ternatipinnate, sometimes entire or more or less dentate, resembling those of certain *Cruciferæ*, &c. Their flowers, white, yellow, or pink, are in compound umbels; nothing is so variable as the number and dimensions of the bracts of their involucres and involucels, both of which are often completely wanting.[1]

It is difficult to separate clearly from *Pimpinella*, that is from *Carum*, *Bulbocastanum*, herbs with a tuberous root or rhizome, in which the bracts of the involucres and involucels are often but not constantly wanting, and which have a fruit generally more oblong with mericarps subcylindrical or slightly compressed at the sides, attenuate at the summit. The vittæ are numerous, continuous or interrupted, very distinct or very thin, and the face of the seed is concave or traversed by a deep furrow. These plants inhabit temperate Europe, Western Asia, and the north of Africa.

Sison Amomum.

Fig. 122. Fruit (6).

Sison Amomum (fig. 122) is also a very near neighbour of *Carum*, with a short, almost didymous fruit, and it is to *Carum* what *Heraclium* is to *Peucedanum;* for its vittæ, wide and solitary in each furrow, occupy only a variable extent of the upper portion and terminate in a point or in a mass. It is an annual or biennial herb of Europe.

Ammi is also very analogous to the Caraways. The calyx is but little developed or nil; the stylopods are conical or depressed; and

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Carum), 852 (*Lomatocarum*, *Sympodium*, *Elwendia*), 853 (*Bunium*, *Muretia*), 854 (*Lereschia*, *Pimpinella*), 857 (*Reutera*), 862 (*Edosmia*); *Ann.* i. 344 (*Petroselinum*), 345 (*Falcaria*, *Carum*, *Acronema*), 346 (*Pimpinella*, *Anisometros*, *Petrosciadium*, *Reutera*), 347 (*Murrithia*); ii. 696 (*Zizia*, *Ptychotis*), 697, 698 (*Bunium*, *Pimpinella*); v. 65 (*Ptychotis*, *Carum*), 69 (*Bunium*, *Cryptotænia*, *Pimpinella*), 68 (*Deverra*).

[1] Here is doubtfully placed *Froriepia*, a perennial herb of the Levant, unknown to us, but which, according to the characters given of it, would differ from the *Petroselinum* section of *Carum* in having nine ridges in each mericarp of the fruit (5 primary and 4 secondary) and in the absence of vittæ.

the fruit, oval or more or less didymous, otherwise resembles that of *Carum* proper in its solitary vittæ. The face of the seed is flat or slightly concave. What most generally distinguishes it at a glance from *Carum* is the great development of the involucral bracts, which are numerous and trisected. The involucels are also formed of numerous bracteoles. They are perennial or biennial herbs of Europe, the Mediterranean region and the north-western African isles.

In *Cicuta* (fig. 123, 124), the calyx is more developed, and its small folioles are pointed and incurved. The stylopods are depressed,

Cicuta virosa.

Fig. 123. Fruit ($\frac{6}{1}$).

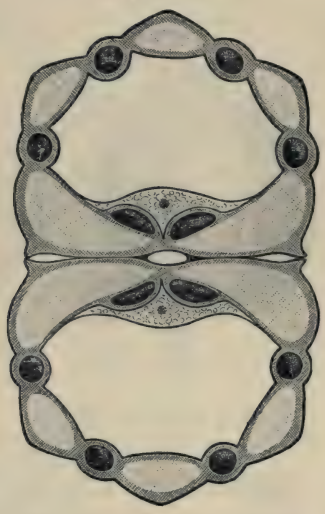

Fig. 124. Trans. sect. of fruit.

and the fruit becomes short, sometimes even wider than long, didymous. Its transverse section is elliptic or nearly so, the shorter diameter of the ellipse corresponding to the interlocular partition. The primary ridges are formed by thick columns of the whitish tissue called suberose; the marginal are prismatic. Interposed there is an equal number of wide vittæ, filled with odorous oil-resin. The face of the seeds is flat or convex. They are perennial aquatic glabrous herbs, having flowers collected in compound umbels, with involucres formed of a few bracts or nil. They grow in the northern hemisphere of both worlds.

The genus *Sium* was one of the most heterogeneous. To it have been referred *Carum*, *Apium*, &c. It now comprises perennial glabrous

plants of the northern hemisphere of both worlds and of South Africa, growing mostly in moist places and characterized by pinnate leaves with dentate divisions, compound umbels with involucres and involucels of an indefinite number of bracts, white flowers furnished with very distinct pointed sepals, oval or oblong fruit, of which the carpophore is indistinct or undivided, and primary ridges, obtuse, or rather thick, slightly prominent, separate the furrows, in which are multiple vittæ, but variable in number.

In the Celery (*Apium*), differing little from *Carum*, the petals are most frequently entire or nearly so, white, pointed or obtuse, and the fruit (fig. 125), short, oval, or rather wider than long, is laterally compressed, contracted at the commissure, with obtuse primary ridges and solitary vittæ. The carpophore is bifid or undivided; bipartite in *Oreosciadium*, the fruit of which is a little more elongate. The seed has nearly a circular transverse section. They are perennial or annual herbs, having pinnate or ternatipinnate leaves, compound umbels, with or without involucels; the involucre nil or represented by a few bracts. *Apiastrum* differs little from *Apium*. The didymous fruit is much more compressed, very contracted at the commissure, rugose, with depressed stylopods and entire sessile petals. They are annuals of North America, with compound umbels resembling cymes, without involucres or involucels.

Apium graveolens.

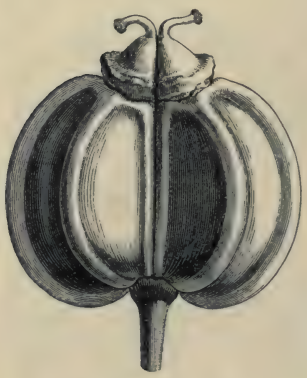

Fig. 125. Fruit (♀).

Formerly *Triania* was referred to *Apium* and *Pimpinella*. It may, in fact, be described as *Apium*, whose oval or didymous fruit, more or less compressed perpendicularly to the partition, has its primary nervures occupied by a large vitta representing a cylindrical column of resinous substance. In the furrows, the vittæ are nil or but little developed. The ridges are more or less prominent, smooth, or rugose, or cross plaited, or bubble like, and divided into small soft and superposed lobes. This last form is particularly marked in *Rumia*, in which the secondary ridges are sometimes visible though very little developed. The seeds are more or less channelled, and the vittæ,

internally prominent, are moulded on the furrows and have a face sometimes flat and sometimes concave. They are glabrous perennial

Szovitzia callicarpa.

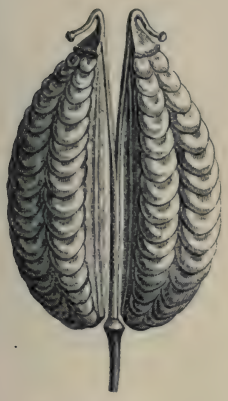

Fig. 126. Fruit (½).

Fig. 127. Trans. sect. of mericarp.

herbs of temperate Asia and the Mediterranean region. Close beside them are ranged *Szovitzia* (fig. 126, 127), often referred to the Carrot group, having oblong obovoid fruit with prominent ridges, divided into rounded, superposed, suberose lobes. But these are the secondary ridges corresponding to as many vittæ, whilst the primary ridges are indistinct. The only species known is an annual of the Caucasian region, with compound umbels, without involucre.

Lichtensteinia Beiliana.

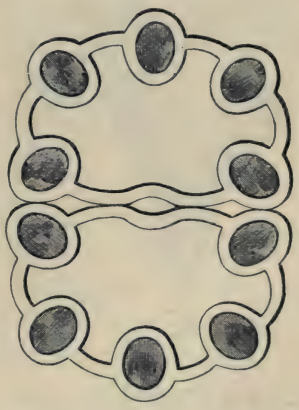

Fig. 128. Trans. sect. of fruit (½).

Lichtensteinia is also allied to *Trinia*, but by another character: the thick and cylindrical vittæ filled with resinous matter occupying the thickness even of the primary ridges. The latter are nearly all equal, obtuse, and but little prominent. The two reflexed branches of the style are supported by a long cone representing the stylopods and surrounded at the base by five well developed, triangular, persistent sepals. They are perennial plants of South Africa and St. Helena, with radical leaves.

Rhyticarpus has many of its characters. The fruit is obovoid or pear-shaped, slightly compressed perpendicular to the partition, with mericarps more or less decurrent at the base on the pedicel, having five nearly equal little-prominent ridges, and alternate solitary vittæ, deeply situated; often rugose on the surface, and surmounted by conical stylopods continuous with the recurved styles. The sepals are less developed than those of the preceding genus. They are glabrous herbs or shrubby plants, with trisected leaves, the segments of which are pinnate, or even reduced to the rigid and linear petiole. *Rhyticarpus* is from the same region as *Lichtensteinia*, from which it differs chiefly in the position of the interjugal vittæ. Near it is likewise placed *Heteromorpha*, a shrub with entire, trilobed, or trifoliolate leaves, inhabiting eastern and southern tropical Africa. Its flowers are nearly those of *Lichtensteinia*: but the obovoid, almost obpyramidal fruit (fig. 129), is formed of two more or less dissimilar carpels, surmounted by pointed sepals. Either all or only three of the vertical ridges corresponding to the sepals are dilated to rather wide rigid triangular wings; in the latter case the two mericarps have not the same number, and appear dissimilar.[1]

Heteromorpha arborescens.

Fig. 129. Fruit (½).

Pyramidoptera cabulica.

Fig. 130. Fruit (½).

Bupleurum (fig. 131–133) comprises *Umbelliferæ* exceptional in their habit and in their leaves, always entire, often grasslike, frequently attenuate at the base, and sometimes cordate or perfoliate. The compound

[1] *Pyramidoptera cabulica*, whose place in this family is still very uncertain, has an obpyramidal fruit (fig. 130) like that of *Heteromorpha*, but much more regular, finally separating into

umbels are ordinarily but not constantly surrounded by involucres and involucels. The flowers, yellow or greenish, have a little developed calyx, or oftener none, entire valvate petals, inflexed at the summit, and the upper face divided by a vertical ridge into two hollows which received the cells of the anthers. The fruit is more or less compressed laterally; and that is its only constant character, for it is more or less elongate; the five ridges of the mericarps are more or less prominent and sometimes even aliform; the vittæ are nil or very fine, irregular, incomplete or divided into superposed or unequal islets; or well marked, multiple or solitary in each furrow; the seeds are nearly cylindrical or vertically furrowed opposite the vittæ, having a face slightly convex, or flat, or slightly or very deeply concave, with incurved or involute margin. They are annual or perennial herbaceous plants, or shrubby, glabrous, and from all the temperate regions of the old world. One species is also found in

Bupleurum falcatum.

Fig. 131. Floriferous branch.

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two unequal mericarps one of which has four narrow wings and the other three or less; the latter often sterile. It is a perennial herb with pinnate radical leaves and compound umbels.

the two Americas. *Hohenackeria*, ordinarily placed near *Bupleurum*, consists of low annual herbs from the Mediterranean and Caucasian regions, with simple linear and entire leaves, and capituliform inflorescences situated at the base of the stem. The fruit is in the form of a pitcher, surmounted by a receptacular neck which supports a calyx with simple or double spinescent sepals. The fruit as a whole is compressed perpendicular to the partition and is surrounded by hard flattened primary ridges.

Bupleurum rotundifolium.

Fig. 132. Portion of inflorescence.

The Corianders (fig. 134–139), often referred to another series because their fruit has primary and secondary ridges however little developed, appear to approach more nearly the preceding types from their fruit being compressed perpendicular to the interlocular partition. They constitute a small sub-series (*Coriandreæ*), with fruit as wide as or wider than long. In the true *Coriandrum*, as *C. sativum* (fig. 134–138), the sepals and petals are very unequal, being more developed as they are anterior. The fruit is nearly globular, with mericarps very concave within as also the enclosed seed; the exterior surface is nearly smooth. In *C. testiculatum* (fig. 139), type of a genus *Bifora*, the mericarps are separated from each other by a very marked constriction and form by their union a sort of double sphere. The face has an opening which connects the carpophore with the seeds. It is the same in *Atrema*, from North America, which is a *Bifora* with a less developed calyx, and in *Astoma*, a Levant plant, which has the fruit of *Bifora*, with subglobular mericarps, but more fleshy than that of the preceding types, and with an indefinite number of vittæ. *Schrenckia* forms a section of the Corianders, having the fruit of *Bifora*, with primary ridges a

Bupleurum plantaginifolium.

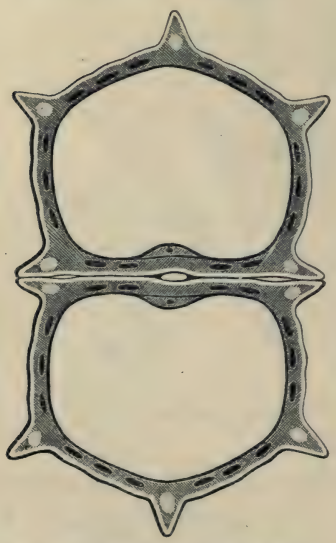

Fig. 133. Trans. sect. of fruit (♀).

little more developed than the secondary, the reverse of what is observed in *Bifora;* but that is a point with us of no generic value.

Coriandrum sativum.

Fig. 134. Floriferous branch ($\frac{2}{3}$).

Perhaps we ought to consider *Cryptodiscus* and *Fuernrohria* as sections

of the same genus, which would then comprise a dozen species, mostly from the Mediterranean and Caucasian regions.

Coriandrum sativum.

Fig. 135. Flower (4/1).

Fig. 136. Long. sect. of flower.

Fig. 137. Fruit (4/1).

Fig. 138. Trans. sect. of fruit (8/1).

In the general form of its fruit *Physospermum* (fig. 140) is so analogous to *Coriandrum* as to be often placed near it. It has little-developed sepals, petals terminated by a long inflexed point, flattened conical stylopods, and a fruit short or wider than long, and compressed perpendicular to the partition, where it is constricted, didymous, with the primary ridges very little prominent

Coriandrum (*Bifora*) *testiculatum.*

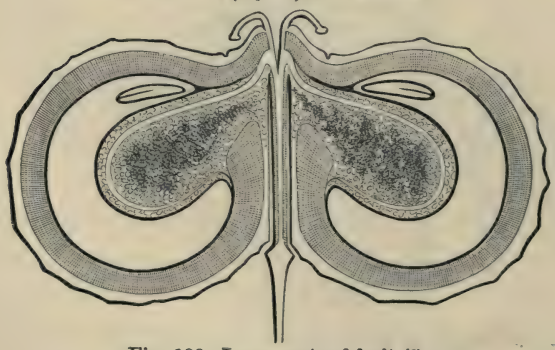

Fig. 139. Long. sect. of fruit (8/1).

and solitary vittæ in the interposed furrows. They are glabrous perennial herbs, European and oriental, with decompound ternati-pinnate leaves and compound umbels, furnished with involucres and involucels formed of numerous bracts. The seeds are concave on the face, in which the raphe is sunk. *Molopospermum* (fig. 141) has nearly all the characters of *Physospermum*, especially in the organs of vegetation; but in the fruit, more elongate, constricted also at the commissure, the primary ridges are very unequally developed. The two marginal are reduced to very small dimensions, whilst the dorsal and the two latero-dorsal alone project in the form of prisms with a blunt independent angle; which gives the transverse section of each mericarp a trapizoidal form. The vittæ are solitary and well developed, and the seed there has deep canals. The only *Molopospermum* known (*M. cicutarium*) inhabits Central and Southern Europe. *Smyrnium* holds an intermediate position between *Molopospermum* and *Physospermum* by the prominence of its primary ridges. The two marginal are often little developed at the commissure, which is more or less hollowed. The fruit (fig. 142–144) is generally short, or even wider than long, with numerous vittæ. The face of the seeds is concave and the margin generally involute. They are biennial plants of Europe, the Levant and Northern Africa, glabrous, having compound umbels with involucres and involucels nil or reduced to a few bracts. We can distinguish

Physospermum aquilegifolium.

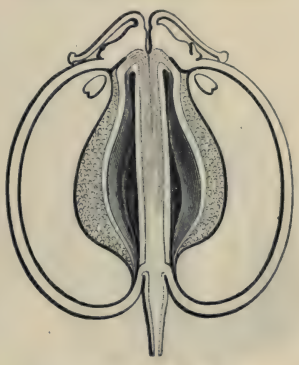

Fig. 140. Long. sect. of fruit (5/1).

Molopospermum cicutarium.

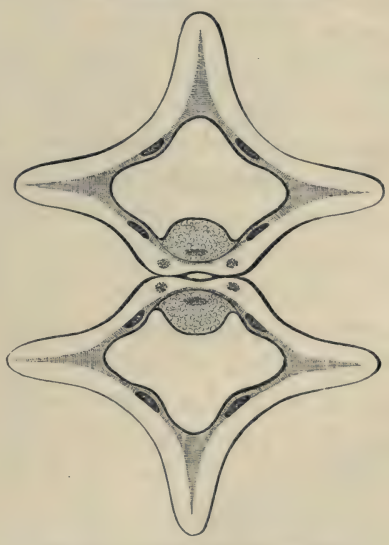

Fig. 141. Trans. sect. of fruit (5/1).

only as sections: *Anosmia*, from Crete, having a small fruit, with a variable number of vittæ sometimes a single one in each furrow; *Smyrniopsis*, from the Levant, whose fruit has mericarps much less incurved from base to summit, marginal ridges more developed and

Smyrnium Olusatrum.

Fig. 142. Fruit (½).

Fig. 143. Trans. sect. of mericarp.

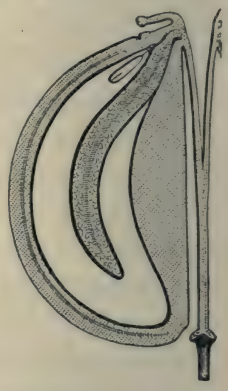

Fig. 144. Long. sect. of mericarp.

one or two vittæ in each furrow; *Eleutherospermum*, from the same country, whose fruit is more elongate, with five prominent and sharper ridges to each mericarp, and generally three relatively more superficial vittæ in each furrow; *Eulophus*, American, having a more elongate fruit with a variable number of (but not solitary) vittæ in each furrow, and a more involute seed than the true *Smyrnium*.

Conium (fig. 145–148) consists of glabrous dicarpous herbs, having compound umbels, with involucres and involucels formed of a variable number of bracts, petals more or less unequal, and stylopods in form of very depressed cones. The fruit is short ovoid, somewhat compressed perpendicular to the partition and there hollow. The five primary ridges of each mericarp are nearly equal and tolerably prominent, with a transverse section in form of an isosceles triangle, and smooth or more generally crenelately undulate. The vittæ are nil or rudimentary, and the very fine and irregular coloured lines borne by the fruit are of quite a different nature. The carpophore, described as undivided, sometimes separates into two. Of the two species of *Conium* known, one is very common throughout the northern hemisphere of our world; the other belongs to the east and south of Africa. With this we can connect as a section only, *Vicatia*, a

perennial herb of the Himalaya, having the same fruit as *Conium* with smooth ridges, numerous vittæ more or less distinct, and invo-

Conium maculatum.

Fig. 145. Floriferous branch ($\frac{1}{2}$).

lucres of a single bract, or disappearing altogether. A small collarette surrounds the base of the conical stylopods.

Arracacia has long been referred to *Conium*. It has nearly the flower with or without distinct sepals. The stylopods are conical, ordinarily rather elongate; the inferior margin is dilated and undulated. The fruit is much more elongate than that of *Conium*, more or less compressed perpendicular to the partition, and pointed at the summit. The ridges are nearly equal and but little prominent; the marginal or lateral rather more than the others. In each furrow are several unequal vittæ or one wide one filled with an aromatic

Conium maculatum.

Fig. 146. Flower ($\frac{10}{1}$).

Conium maculatum.

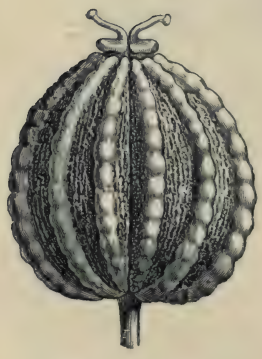

Fig. 147. Fruit ($\frac{1}{1}$).

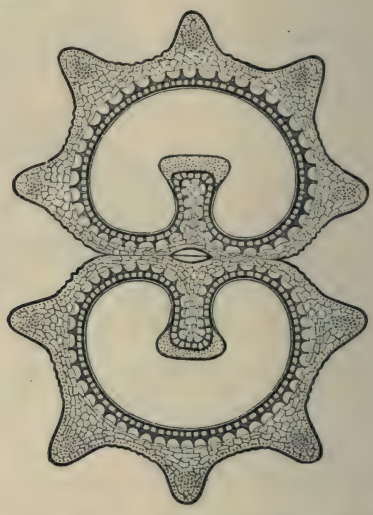

Fig. 148. Trans. sect. of fruit.

substance. The margin of the seed is more or less, sometimes very much, incurved or involute. They are perennial herbs, with stock sometimes tuberous, pinnate or decompound leaves, compound umbels with involucels, with or without involucres. All are

natives of the mountains of the warm western regions of the two Americas.

Trachydium (fig. 149, 150) consists of annual or perennial herbs, of temperate Asia, chiefly the mountains of northern India, whose characters are mostly those of the preceding genera, but the fruit, oval compressed and hollow on each side of the commissure, is furnished with a bifid or bipartite carpophore, and surmounted by a conical depressed or elongate disk. The ridges are obtuse, covered with rugose, papillose or irregular vesicular prominences, and the exocarp separates in the form of a floating membrane, from the deep bed of the pericarp. In each furrow are from one to three vittæ, and the seed has a concave face, traversed only by a vertical furrow in *Eremodaucus*, which forms a section of that genus of which the carpophore is believed to be undivided.

Trachydium Roylei.

Fig. 149. Face of mericarp.

Fig. 150. Back of mericarp.

Near *Conium*, with a fruit more elongate and similar to that of *Carum*, *Musenium*, comprising perennial and cæspitose herbs of North America, has no involucre, umbels with numerous bracteoles, with a central flower generally more developed than those at the sides, a separating carpophore, numerous vittæ, a channeled seed with concave face, white or yellow petals with inflexed point, unequal persistent sepals, the two larger crowning the anterior mericarp. *Musenium* has decompound pinnate leaves with pinnatifid segments; the flowers are white or yellow, and the fruit is covered with short rugose hairs. *Tauschia* also consists of small American perennial plants similar to *Musenium*. The radical leaves are pinnate or bipinnate with oval or dentate segments. The fruit, oval and compressed perpendicular to the partition, resembles that of certain *Arracacias*. It is glabrous, with equally prominent ridges and solitary vittæ in the furrows. The stylopods are depressed and the carpophore is undivided. It disappears or remains adnate to the mericarps in *Erigenia*, a low North American herb, the subterranean portion of which is a small tubercle from which spring some decompound

ternatipinnate leaves, and whose compound umbels have few-flowered, often capituliform umbellules, with an involucel of numerous bracts. The petals are entire, flat; and the stylophores, depressed and concave within, are exterior to two long subulate stylary branches. The fruit, oboval, compressed perpendicularly to the partition, has five linear little-developed ridges and numerous vittæ. The carpophore is indistinct and the mericarps curve from summit to base; the face of the seed is concave. In *Orogenia*, which appears to us to constitute a section of the same genus, this concavity has three vertical ridges, one middle and two marginal, and the whole plant is said to have only two or three long petiolate leaves.

Chærophyllum (*Anthriscus*) *silvestre.*

Fig. 151. Floriferous branch ($\frac{1}{2}$).

In *Oliveria*, a Levant annual whose habit and the general appearance of its inflorescence have caused it to be referred to *Lagœcia*, though its umbels are really compound, there are five narrow sepals and petals much inflexed and adnate at the summit, surmounted by two wide salient auricles (corresponding to the margins of the organ). The two erect styles are accompanied in their lower half by long conical stylopods, and the fruit is oblong, much compressed perpendicular to the partition, covered with thick hairs. The primary ridges are little prominent and the vittæ solitary. The seed is more or less concave within. The bracts of the involucels are wide and three-lobed. Apart from its inflorescence, this genus nearly approaches the following.

These form a small group *Scandicineæ* or *Chærophylleæ*. The fruit

is elongate, more or less pointed at the top, with elongate seeds whose face is more or less concave or furrowed. *Chærophyllum* (fig. 151–153) is particularly so. The summit of the fruit is attenuate and the stylopods are small, conical, entire or undulate at the margin. The mericarps are somewhat compressed laterally and the ridges are rarely prominent and subalate. The vittæ are solitary; the carpophore is undivided or bifid. It comprises herbs from all the temperate regions of the world, having compound umbels with the bracteoles of the involucels narrow or foliaceous, without involucre or with only one or two bracts at the base of the stems of the inflorescence. We unite as sections: *Freyera*, with narrow ridges and tuberous roots; *Anthriscus*, whose fruit, often a little shorter, is without ridges, with solitary vittæ or none; *Oreomyrrhis*, from the mountains of South America, New Zealand and Australia, whose umbels are simple; or rather the branches which bear them play the part of a principal axis of a compound umbel; *Grammosciadium*, Levant herbs with multifid leaves and multifid bracts to involucres and involucels, whose persistent sepals are much developed and seminal face slightly concave. The primary ridges are dilated to narrow wings. *Rhabdosciadium*, perennial Persian herbs, are near this last section by their elongate fruit; but instead of vittæ they have irregular masses of resinous substance in the furrows, and their inflorescence resembles that of the *Echinophoreæ* and especially that of *Crenosciadium*, the fertile flowers being sessile at the middle of the radii which bear male flowers higher up. The leaves are often reduced to the petiole or pinnatisect.

Chærophyllum (Anthriscus) silvestre.

Fig. 152. Fruit (♀).

Chærophyllum Cerefolium.

Fig. 153. Fruit (♀).

Myrrhis (fig. 154, 155) is also very near *Chærophyllum*. It has an elongate fruit, shortly rostrate, with wider commissure, more prominent, sometimes carinate primary ridges. The vittæ are solitary, very thin, or nil; the face of the seed is concave or traversed by a

vertical furrow. They are perennial herbs, very aromatic, resembling certain *Chærophylla*. One is European; the leaves are decompound, bi- or tripinnate. In a second species, from North America, type of the genus *Glycosma*, the leaves are bi- or tripinnate. We unite to it as a section *Osmorhiza*, from the same country as *Glycosma*, and similar to it, but with very numerous vittæ, sometimes very thin or almost nil.

Scandix Pecten Veneris.

Fig. 156. Fruit (♀).

Myrrhis odorata.

Fig. 154. Fruit (♀).

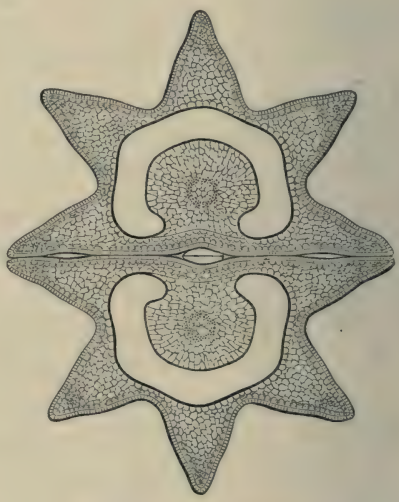

Fig. 155. Trans. sect. of fruit.

Analogous to the preceding genera, *Scandix* is thought to differ from them by its narrower and more elongate fruit, prolonged above the cells in a long slender beak surmounted by the stylopods and styles (fig. 156). The carpels, nearly round, have obtuse ridges and solitary vittæ or none. They are annual herbs of the north temperate zone of the old world. The umbels are compound and the involucre is nil or formed of a single bract. The flowers are most frequently polygamous.

In *Ottoa*, a perennial plant of Columbia and Mexico, the flowers and fruit are nearly those of *Chærophyllum;* the

latter, rather shorter, surmounted by a thick conical stylopod. The petals are entire, and the habit is altogether peculiar, resembling that of many plants of the following series. It is a glabrous herb, with simple stem, simple leaves (reduced ? to their petiole), entire, cylindro-conical, fistular and divided by transverse partitions. The base is dilated to a sheath. The inflorescence is a compound umbel, supported by a long axis, and without involucre and involucels.

V. PENNYWORT (HYDROCOTYLE) SERIES.

The Pennyworts[1] (fig. 157–161) have hermaphrodite or polygamous flowers. The receptacle is in the form of an oval or orbicular sac much compressed at the sides. The margin of the orifice is cut straight, and bears no trace of sepals, or rather these are represented by five small teeth, ordinarily very indistinct. The five petals are inserted on the receptacular margin; they are sessile, entire, pointed or slightly obtuse, valvate in prefloration, or more rarely somewhat imbricate. Five equally epigynous stamens alternate with them, formed each of an incurved filament and a bilocular, sometimes didymous anther, slightly introrse or dehiscing by two nearly marginal clefts. A disk[2] in the form of a very depressed cone crowns the ovary, which has two cells, one anterior, the other posterior, and is surmounted by

Hydrocotyle vulgaris.

Fig. 157. Habit.

[1] *Hydrocotyle* T. *Inst.* 328, t. 173.—L. *Gen.* n. 325.—Adans. *Fam. des Pl.* ii. 100.—Thunb. *Diss.* ii. 410.—J. *Gen.* 226.—Lamk. *Dict.* iii. 151; Suppl. iii. 72; *Ill.* t. 188.—A. Rich. *Monogr. Hydroc. Ann. Sc. Phys. Par.* (1820) iv. 164 (part).—Lag. *Am. Nat.* ii. 102.—Koch, *Umb.* 144.—DC. *Mém.* 26; *Prodr.* iv. 59.—Spach, *Suit. à Buffon*, viii. 173.—Endl. *Gen.* n. 4355.—H. Bn. *Payer Fam. Nat.* 336.—B. H. *Gen.* 872, n. 1.—Hook. *Fl. Ind.* ii. 667.—Baker, *Fl. Maurit.* 131.—*Centella* L. *Gen.* n. 1051.—*Solandra* L. f. *Suppl.* 176.—*Trisanthus* Lour. *Fl. Cochinch.* (ed. 1790) 175.—*Glyceria* Nutt. *Gen. Nov. Amer.* i. 177.—*Chondrocarpus* Nutt. *loc. cit.*

[2] Perhaps it corresponds to the stylopods.

two stylary branches of variable length, with pointed or obtuse stigmatiferous extremity. High in the internal angle of each ovarian cell is inserted a descending anatropous ovule, with micropyle directed upwards and outwards.[1] The fruit (fig. 160, 161) is a diachene, sometimes at first a little fleshy on the surface, shortly oval, or nearly orbicular, or didymous, and very much compressed per-

Hydrocotyle asiatica.

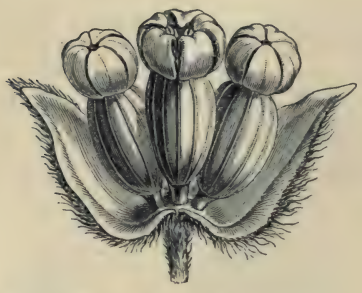

Fig. 158. Three-flowered inflorescence.

Fig. 159. Long. sect. of flower (♀).

pendicular to the partition, often constricted at the commissure. The ridges, very little developed, linear, scarcely projecting, are all primary, or rather the secondary are perceptible, but very indistinct. Each mericarp may therefore have as many as nine ridges, and the dorsal corresponds to the margin of the fruit. They may be connected by a network of veinules. In the thickness of the ridges, there may be here and there one or two vittæ, most frequently irregular, broken or rudimentary.

Hydrocotyle consists of plants ordinarily small, herbaceous, aquatic, often perennial, rarely subshrubby at the base. The perennial species generally have a slender stock creeping on the moist soil or in the mud, sending out adventitious roots at the nodes. The leaves are alternate, petiolate, entire, or crenelate, digitinerved or palmatisect, not unfrequently peltate, rarely narrow and elongate, uninerved. They are accompanied at the base by scarious stipules,[2] entire or laciniate, sometimes none. The flowers,[3] hermaphrodite or polygamous, are arranged in a very variable manner at the nodes of the stem or at the end of the branches. One or many peduncles from the

[1] Ordinarily without a true coat or with only a slight rudiment.

[2] Their stipular nature has been disputed.

[3] Small, greenish, yellow or reddish.

same point (fig. 157) terminate each in a small umbel (or false umbel[1]) simple or with two or several ranks of flowers superposed, or in a compound umbel.[2] This is most generally the case in the true *Hydrocotyle*,[3] which have pointed valvate petals, and fruit with no or very indistinct secondary ridges. In *Centella*, another subgenus of which a separate genus has been formed, the petals are obtuse, wider, oftener imbricate. The secondary ridges of the fruit are frequently more distinct. In *H. asiatica* (fig. 158–161), which may be considered a type of this group, the floral peduncles bear only a few flowers, often three, of which one, older, is terminal, accompanied by two bracts in the axil of each of which is a flower of the second generation. It appears then a biparous and three-flowered cyme.[4] In *Micropleura*,[5] which we make another subgenus, the inflorescences, more or less ramified, bear fertile terminal flowers, and, immediately below, a few younger flowers, mostly sterile, male and pedicellate.

Hydrocotyle asiatica.

Fig. 160. Fruit (♀).

Hydrocotyle asiatica.

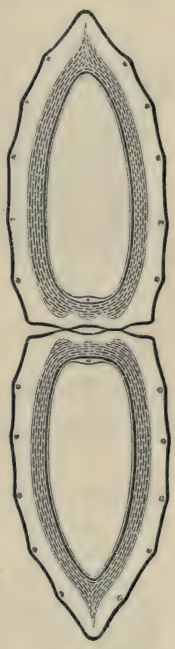

Fig. 161. Trans. sect. of fruit (♀).

Thus constituted,[6] the genus *Hydrocotyle* comprises about seventy species,[7] mostly aquatic, which belong to all the warm and temperate regions of the globe.

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[1] The central flower is often older than those which immediately surround it.

[2] Particularly in *H. bonariensis*, where not only a common axis terminates in an umbel (?) of small secondary floral groups, but where the pedicels of the umbellules are accompanied by a variable number of solitary flowers inserted at the point of divergence.

[3] *Euhydrocotyle* DC. *Prodr.* sect. 1.

[4] Apart from development, it might be considered either a terminal cluster or a biparous cyme, in either case three-flowered, but without possible distinction.

[5] Lag. *Oc. Esp. Emigr.* 15.—DC. *Mém.* 71; *Prodr.* iv. 71.—Endl. *Gen.* n. 4360.—B. H. *Gen.* 873, n. 2.

[6] Sect. 3: 1. *Euhydrocotyle* (DC.); 2. *Centella* (L.); 3. *Micropleura* (Lag.).

[7] R. et Pav. *Pl. Per.* t. 245–248.—Cav. *Icon.* t. 488, fig. 1.—Wight, *Icon.* t. 564, 565, 1002, 1003.—Link et Ott. *Ic. Pl. Rar.* t. 21.—Hook. *Icon.* t. 303, 312; *Exot. Fl.* t. 29, 30.—Reichb.

Trachymene (fig. 162–164) belongs to a sub-series in which the fruit is also compressed perpendicular to the partition, but differs widely from *Hydrocotyle* in habit, and the leaves are without stipules. The flowers of *Trachymene* are in simple umbels (more or less capituli-

Trachymene cærulea.

Fig. 162. Flower (4).

Fig. 163. Long. sect. of flower.

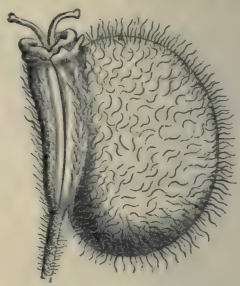

Fig. 164. Fruit.

form) and with an involucre of numerous bracts free or united at the base. The calyx is wanting, or the five sepals or some of them are more or less developed, and the petals, entire, unequal, are imbricate in vexillary prefloration. The fruit is much flattened laterally and the two mericarps are rarely equal. The anterior may be almost entirely aborted and remain sterile; or rather it differs in form, appearance and superficial condition from the posterior carpel which contains first an ovule, then a seed with narrow aliform raphe. *Trachymene* inhabits Oceania, especially Australia, and consists of herbs often annual, with branches sometimes leaflike. *Xanthosia* and *Siebera*, also Australian, resemble the above especially in the flattened fruit. In the former (fig. 165) the sepals are well developed, wide, cordate, bilobed

Xanthosia rotundifolia.

Fig. 165. Flower (4).

Ic. Fl. Germ. t. 1842.—Harv. et Sond. *Fl. Cap.* ii. 526.—Hook. f. *Fl. Tasm.* 32, 33; *Handb. N.-Zeal. Fl.* 85.—Benth. *Fl. Austral.* iii. 337.—Wedd. *Chlor. And.* ii. 188.—A. Gray, *Man.* (ed. 5) 189.—Chapm. *Fl. S. Unit. St.* 158.—Molkb. *Pl. Jungh.* i. 89.—Thw. *Enum. Pl. Zeyl.* 130.—C. Gay, *Fl. Chil.* iii. 62, 69 (*Micropleura*).—Miq. *Ann. Mus. Lugd.-Bat.* iii. 55.—Boiss. *Fl. Or.* ii. 820.—Gren. et Godr. *Fl. de Fr.* i. 751.—Walp. *Rep.* ii. 381; v. 838; *Ann.* i. 339, 977; ii. 690; v. 58.

or peltate at the base, which is more or less prolonged below the point of insertion. The petals are inflexed and adnate at the summit, forming a salient ridge which divides into two lobes. They are shrubby or herbaceous plants, often covered with stellate hairs, with simple, dentate, lobed or ternisect leaves. The flowers are in irregularly compound umbels, with bracts sometimes wide and petaloid, more rarely reduced to a few or even a single flower. In *Siebera*, the sepals are nil or narrow, subulate; the petals, concave, imbricate, equal or nearly so; the fruit, more or less constricted at the commissure, has obtuse but generally distinct primary ridges but no or very fine secondary, covered more or less externally with rugosities; the styles are often elongate and curved; the carpophore is simple. They are ericoid shrubs or perennial herbs, with alternate entire rarely squamiform leaves; the lower sometimes dissected. The flowers are in simple or more generally compound umbels with an involucre of small bracts.

Azorella (fig. 166) is with us the type of a third group in which the mericarps of the fruit are very constricted at the commissure, and are attached to each other only by a central linear edge corresponding to an undivided carpophore. The form of the mericarps varies in the true *Azorellas*. In some they are as wide as thick, in others laterally compressed, in others dorsally. They bear each five primary ridges, nearly equal, but slightly prominent or even scarcely visible. One is middle dorsal, the others vary in position according to the form of the mericarps; thus when the latter are dorsally compressed, the margin being more or less thick and smooth, there is one ridge without and one within this margin. The latter may be carried back more or less on the face as in *Spananthe*, an American species with alternate or opposite leaves, which we make only a section of *Azorella*. The other sections are also founded on the habit and inflorescence. The stems are most frequently cæspitose. In *Microsciadium* and *Pozoa*, the leaves are radical; and the flowers form many-flowered or irregularly branched umbels. In *Pozoa* the umbels are pedunculate, simple, and the involucre is formed of bracts connate for a very

Azorella trifoliata.

Fig. 166. Fruit (½).

variable extent of their margin, sometimes even to the summit. In *Fragosa*, the leaves are numerous on the short erect aerial stems, imbricate, often narrow, linear. The inflorescences are terminal umbels, with pedicels frequently short. In *Apleura*, which appears to us to be also a section of the same genus, the inflorescence is reduced to one terminal flower, and the pericarp has a hard interior layer, representing a kind of putamen. Natives of Western and Southern America, chiefly the region of the Andes, of Australia and New Zealand, these plants are almost all perennial, sometimes woody at the base; they not unfrequently have scarious stipules or scaly hairs at the base.[1] The habit is sometimes peculiar.[2] *Laretia*, a cæspitose herb of Chili, closely resembling some species of *Azorella*, has flowers in simple terminal umbels with very short pedicels, and fruit, larger than that of *Azorella*, with broad flattened or concave mericarps thinned like wings at the sides. The undivided carpophore unites them only at the median line, and the lateral ridges correspond to the margins. The back bears the three ridges, median and dorso-lateral. *Laretia* is in some respects intermediate between *Azorella* and *Mulinum*, which has given name to a tribe (*Mulineæ*). The flowers of *Mulinum* have well developed pointed sepals, entire petals and elongate styles dilated interiorly to conical stylopods. In the fruit the back of the mericarps is quite concave, forming a re-entrant dihedral angle; and as the connexion of the mericarps is linear, the transverse section of the fruit (fig. 167) is in the form of a St. Andrew's cross. *Mulinum* comprises humble plants from

Mulinum spinosum.

Fig. 167. Trans. sect. of carpel (½).

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[1] Although generally referred to another division of this group, the genus *Klotschia* appears to us very closely allied to *Azorella* and at the same time to *Hydrocotyle* such as *Micropleura* of which it has the inflorescence. It has the peltate leaves of certain American species of *Hydrocotyle*, triangular or lobed, or oval, denticulate. The inflorescence has one hermaphrodite flower in the centre and around it younger flowers, male or likewise hermaphrodite. The petals are narrow, carinate, and the conical stylopods are continuous with the base of the stylary branches. The fruit is similar to that of *Azorella* in which the mericarps are more compressed parallel than perpendicular to the partition. The primary ridges only are salient little developed, and may have a thin vitta in their interior. *Klotzschia* consists of herbs from tropical Brazil.

[2] Resembling mosses, lichens, &c.

the Andean and antarctic regions of America, woody at the base, rigid, with 3–5-sect or 3–5-fid leaves, often spinescent, with petioles often dilated to scarious sheaths. The flowers, not unfrequently unisexual, are in simple umbels. *Hermas*, from the Cape, is analogous to *Mulinum*. It has its fruit, succeeding flowers whose sepals are well developed and whose petals resemble staminal filaments. They are perennial herbs with rosetted, entire, hairy or woolly leaves, and with long simple or ramified axes terminating in umbels apparently compound. It should be observed that in these two genera, as also in the three following, the distribution of the primary ridges is such that the median and the two intermediaries are dorsal, while the two lateral, instead of being marginal, are relegated (sometimes very far) to the interior face of the mericarp.

Huanaca and *Diposis* are also closely allied to *Mulinum*. In the latter, of which a genus *Asteriscium* has been made, the leaves are those wrongly called radical, lobed or variously divided, and the inflorescence is a simple many-flowered umbel with an involucre of small bracts. The fruit is much compressed perpendicular to the partition, similar to that of *Mulinum*, with a narrow commissure and mericarps dorsally concave. *Gymnophyton* (fig. 168) is *Asteriscium* whose hard branched axes are without true leaves; but the inflorescences are umbels in which the interior flowers are fertile and the exterior male with longer pedicels. The true *Diposis*, such as *D. saniculæfolia*, is to the preceding what *Micropleura* is to other genera of *Hydrocotyle*. In fact the ramified inflorescences bear, below a female flower of sessile fruit, two lateral pedicels which terminate in a flower generally male or sterile. It is moreover a glabrous herb, with radical divided leaves and disklike carpels. All these plants inhabit extratropical South America. *Huanaca* is a cæspitose herb with leaves mostly radical. In the true *Huanaca* of South America, they are palmatisect, and the floriferous axes are ramified. In *Canahua*, which are Mexican, the leaf is pinnatisect or pinnatipartite, and the umbel is simple supported by a long slender

Asteriscium (*Gymnophyton*) *robustum*.

Fig. 168. Fruit (♀).

peduncle. In *Diplaspis*, native of Australia and especially of Tasmania, the leaves are small, thick, cordate or orbicular, and the umbel is simple at the end of a small axis. In all these sections of the same genus, the petals are entire, the stylopods conical, and the fruit formed of two dorsally concave carpels united only by a linear undivided carpophore, thus resembling that of *Mulinum* or *Diposis*, but the aliform margins are less dilated and the dorsal cavity more obtuse. This genus has scarious stipules (?).

The same general configuration of fruit occurs in *Bowlesia* (fig. 169), whose carpels may be less concave still or nearly flat at the back. The transverse section of the fruit somewhat resembles two isosceles triangles united only at the apex, which corresponds to the carpophore. They are dichotomously ramified herbs, with hairs mostly stellate, leaves nearly always opposite, stipules scarious, laciniate or ciliate. The limb is entire or dissected. The flowers are disposed as in *Hydrocotyle* and have entire petals. All are American except *B. oppositifolia*, which grows in the Canaries, whose habit somewhat resembles that of some *Cucurbitaceæ*, and is distinguished from other species of the genus by the glochidate hairs borne by most of its organs including the fruit.

Bowlesia (*Drusa*) *oppositifolia*.

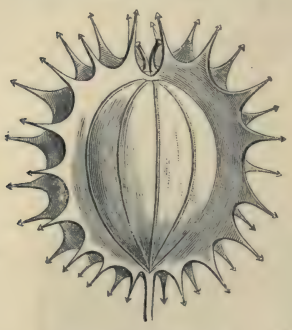

Fig. 169. Fruit ($\frac{5}{1}$).

Eryngium (Sea-Holly) has given its name to a sub-series often even raised to the rank of a tribe (*Eryngieæ*). The flowers (fig. 170–172) are collected in globular or ovoid sometimes spikelike capitules, terminated or not with a flower; so that the inflorescence often resembles that of the *Compositæ*. Each flower is situated in the axil of a bract, entire or divided, which is wanting or very little developed in *Alepidea*. The sepals are wide, membranous, sometimes pointed, imbricate, often as much developed as the petals, which have a long terminal lobe inflexed and applied to the interior face. The two stylary branches are long and slender and have externally at the base two depressed stylopods. The fruit, ovoid or obovoid, with a transverse section nearly circular and wide com-

missure, has primary ridges but little prominent and thick or thin vittæ, vertical or anastomose, sometimes none. *Eryngium* is herbaceous, more rarely arborescent, quite or nearly glabrous, with very variable leaves, either lobed, or dissected, or entire, and ciliate, dentate and resembling in form those of certain Monocotyledons (*Graminæ*, *Bromeliaceæ*, *Pandaneæ*), not unfrequently rigid and

Eryngium maritimum.

Fig. 171. Flower (½).

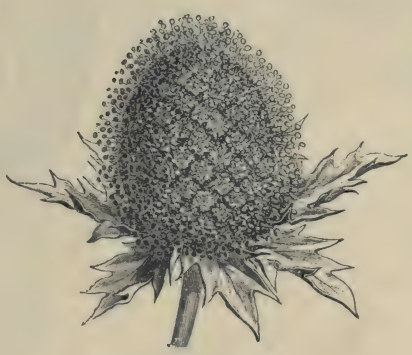

Fig. 170. Inflorescence.

Fig. 172. Long. sect. of flower.

pointed at the margin. They inhabit all warm and temperate regions of the globe; only *Alepidea* represents the genus in South Africa.

Astrantia (fig. 173–176) has nearly the flowers of *Eryngium;* but they are polygamous, and in the same inflorescence, resembling an umbel, the outer flowers however being less developed than the central; the female flowers are sessile or shortly pedicellate; the males having longer pedicels. The entire inflorescence is surrounded by numerous bracts, forming a collarette, wide, membranous, often coloured. As in *Eryngium* there is no carpophore, and the fruit, whose transverse section is circular or a little compressed perpendicular to the partition, has equal primary ridges, the surface of which is raised or bubbled. The seeds are facially entire and have an abundant albumen in the summit of which is lodged a small embryo. In *Epipactis*, type of a genus *Hacquetia* (fig. 176) these ridges are much less developed and the fruit is more compressed and constricted at the commissure. In *A. eryngioides*, of which the

genus *Actinolema* has been made, the ridges of the fruit are in the form of a dentelate crest, and the habit is very peculiar, the stems

Astrantia major.

Fig. 173. Floriferous branch.

Fig. 174. Fruit (½).

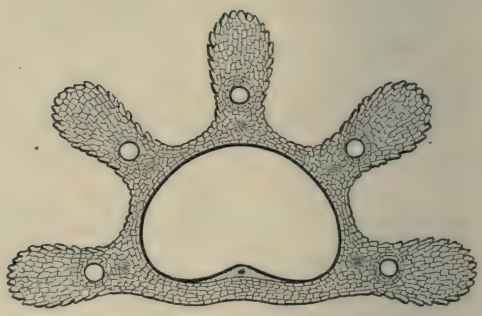

Fig. 175. Trans. sect. of mericarp.

being annual, di- or trichotomous, and the few-flowered inflorescences being surrounded by large spinescent bracts, simple or dentate, like the sepals. It is a European or oriental genus.

Astrantia (*Hacquetia*) *Epipactis.*

Fig. 176. Inflorescence.

Sanicula (fig. 177, 178) resembles *Astrantia* in its polygamo-dicœcious flowers, the form of its fruit and absence of carpophore. But the inflorescence is composed of several umbels, arranged in cymes ordinarily biparous, and in each umbellule there is generally an indefinite number of male and one or a few hermaphrodite flowers. The

latter are terminal relatively to the males which surround them. The sepals are valvate and inflexed, and the fruit is quite covered with prickles hooked at the point. *Sanicula* comprises herbs from all parts of the world, with palmati-3–5-sect leaves and inflorescences on an erect bare or more rarely leaved axis.

Sanicula europæa.

Fig. 177. Facial view of mericarp (5/1).

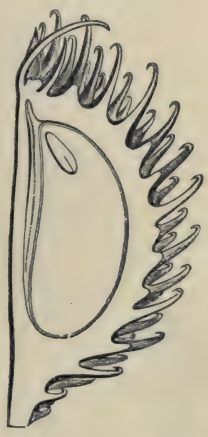

Fig. 178. Long. sect. of mericarp.

Arctopus, perennial herbs of the Cape, are analogous both to *Astrantia* and *Eryngium*, and especially resemble certain of the latter in their rosetted leaves with dilated petiole,

Petagnia saniculæfolia.

Fig. 179. Portion of inflorescence.

Fig. 180. Long. sect. of fertile flower (5/1).

dentate or incised, ciliate or spinous limb. The flowers are diœcious

and grouped in fascicles of simple umbels. The males have a double perianth resembling a star with ten branches, and five long exserted stamens. The females, few and surrounded with accrescent bracts, have an elongate gourd-like ovary and fruit, with a neck surmounted by the perianth and two long subulate styles. Most frequently one of the two cells is aborted and remains sterile, rudimentary; by that, this genus is intermediate between the preceding and the three following genera, in which there is only one carpellar cavity at adult age.

Lagoecia cuminoides.

Fig. 181. Floral head.

Apart from this common character these differ sufficiently in other respects from each other to constitute each a separate sub-series. Two of them, *Petagnia* and *Actinotus*, have a double style with one uniovulate cell in the ovary. The latter has simple umbels with an involucre similar to that of *Astrantia*, polygamous flowers and an unsymmetrical fruit. They are Australian, and sometimes cæspitose plants as those named *Hemiphues*. But most frequently they are branched herbs with dentate lobed or dissected leaves. *Petagnia* (fig. 179, 180) is a perennial herb from Sicily having the common organs of vegetation of our *Sanicula;* but its dichotomous inflorescences resemble those of a *Caryophyllea*. The female or hermaphrodite flowers, sessile in the dichotomies, have a conical ovary with

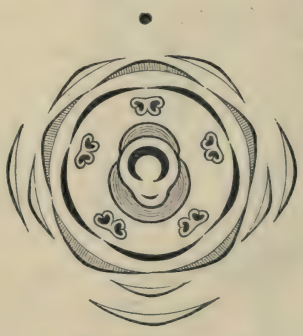

Fig. 182. Diagram.

the ridges of which the pedicels which bear the flowers of the following generation are connate in their lower part; these may sometimes be fertile but are much more frequently male or sterile.

The place in this family of *Lagoecia cuminoides* (fig. 183, 184), an annual of the entire Mediterranean region, with the habit and foliage of many *Umbelliferæ*, especially of *Oliveria*, has been much contested.

Lagoecia cuminoides.

Fig. 183. Flower (½).

Fig. 184. Long. sect. of flower.

This is because its ovary with a single fertile cell, which is anterior, is surmounted by a simple style, which is posterior, and an epigynous eccentric disk surrounded by, besides the corolla and andrœcium, five long straight sepals, divided at the margin into five aristate slips.

VI. ARALIA SERIES.

Though generally considered as belonging to a family distinct from that of the *Umbelliferæ*, *Aralia*[1] (fig. 185–190), as we shall see, can only constitute a section of it. The greater part have flowers in pentamerous verticils. The receptacle also, in form a deep ovoid

[1] T. *Inst.* 300, t. 154.—L. *Gen.* n. 386 (part).—J. *Gen.* 218 (part).—Lamk. *Dict.* i. 223; Suppl. i. 416 (part).—DC. *Prodr.* iv. 257.—Spach, *Suit. à Buffon*, viii. 119.—Endl. *Gen.* n. 4558 (part).—Payer, *Organog.* 409, t. 89.—Dcne. et Pl. *Rev. Hort.* (1854) 104.—B. H. *Gen.* 936, n. 4.—C. Koch, *Wochenschr.* (1864) 369.—Seem. *Journ. of Bot.* vi. 133.—H. Bn. *Payer Fam. Nat.* 338; *Adansonia*, xii. 135, 162, 163, 164.—Hook. *Fl. Ind.* ii. 721.

obconical or subturbinate sac, bears on the margin of its upper orifice : a calyx with five teeth, often obtuse, generally not very distinct, often even almost nil; five alternate oval petals, inflexed at the summit and forming together a small pendant key in the bud, more or less

Aralia Ginseng.

Fig. 186. Root (½). Fig. 185. Fructiferous stem.

imbricate in prefloration; five alternipetalous stamens, inserted under the margin of an epigynous disk [1] corresponding to the union of the stylopods of other *Umbelliferæ*. Each stamen has a free filament, inflexed in the bud and replicate upon itself close to the summit, so that the anther, later oscillant, is introrse, as well in the bud, when the filament is incurved, as in the newly opened flower, when the filament is erect and has become exserted. It is, moreover,

[1] It is clearly seen in certain species in which the summit of the ovary emerges more or less from the receptacle, that it is this apical portion of the ovary which thickens to a glandular tissue, sometimes coloured. In the flower of *A. japonica* (fig. 187, 188), this bed is smooth and yellow.

bilocular, dehiscing by two longitudinal clefts.[1] The ovary, inferior, fills the cavity of the receptacle, which envelopes it entirely or leaves the upper portion free. The latter supports a style divided to a variable extent, often even to the base, into five branches superposed to the petals and stigmatiferous at the extremity. The ovary has

Aralia (*Fatsia*) *japonica.*

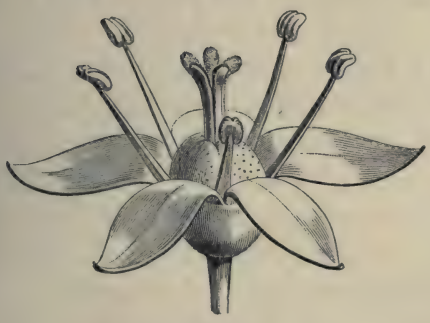

Fig. 187. Flower ($\frac{5}{1}$).

Fig. 188. Long. sect. of flower.

five oppositipetalous cells in the internal angle of each of which is one [2] descending, anatropous ovule with micropyle [3] directed upwards and outwards. The fruit is a drupe crowned with the styles and the calyx or their scars, and the five putamens enclose each a descending seed with thin coats [4] covering a fleshy or horny albumen in the summit of which is lodged a small embryo with superior radicle (fig. 189, 190).

These plants are woody or herbaceous, glabrous or pubescent, sometimes covered with hairs or prickles. The leaves are alternate, digitate or pinnate, compound, or decompound, or ternatipinnate, with the folioles ordinarily serrulate. The base is without or with little developed stipules. The flowers [5] are in solitary umbels, simple or compound, or in umbels united in a terminal cluster, with small bracts and pedicels articulate at the summit, which may be prolonged around the base of the ovary in a small sometimes cuplike collar.

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[1] The pollen of the *Araliecæ* is generally the same as that of other *Umbelliferæ.*

[2] Two originally; but one is early aborted, as in the *Umbelliferæ* proper (PAYER, *loc. cit.* 410).

[3] There is only one envelope and often very incomplete or even almost nil.

[4] They may even be reduced to one or to some layers of cellules.

[5] Small, white, yellow or greenish.

There are some species of *Aralia* somewhat abnormal which, however, cannot be separated from the genus otherwise than as sections. These are: *Dimorphanthus*,[1] whose flowers or some of them are unisexual; *A. japonica* (fig. 187, 188), which has been referred to a genus *Fatsia*,[2] because its leaves are palmatifid, and because its petals have been considered valvate. But they are also often more or less imbricate, and the only feature distinctly characteristic of this section is that the articulation of the ovary on the pedicel does not exist or is very obscure.[3]

A. papyrifera, also considered as a *Fatsia*, then as type of a genus *Tetrapanax*,[4] has likewise pedicels without true articulation. The receptacle is obconical and entirely encloses the ovary, the summit of which is depressed; the petals are four or five in number, valvate or slightly imbricate; and the ovarian cells and divergent styles, two. It is a plant from the island of Formosa, with an abundant pith, palmatifid woolly leaves with stipules long attenuate at the summit.

Aralia (*Stilbocarpa*) *polaris*.

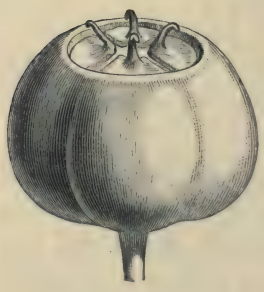

Fig. 189. Fruit (♀).

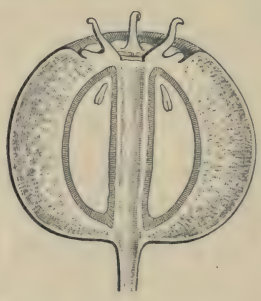

Fig. 190. Long. sect. of fruit.

A. polaris, of which the genus *Stilbocarpa*[5] has been made, has pedicels clearly articulate and three or four cells to the ovary, the summit of which is depressed, as is also that of the fruit (fig. 189, 190), which is globular, smooth, glossy, with three or four putamens. It is an herb of the antarctic polar islands and New Zealand, with

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[1] Miq. *Comm.* 95, t. 12.

[2] Dcne. et Pl. *loc. cit.* 105.—B. H. *Gen.* 939, n. 13 (part).—Seem. *Journ. Bot.* v. 57.—H. Bn. *Adansonia*, xii. 136.

[3] To the point where the receptacular dilatation commences, the pedicel is clothed with a brownish down which stops there suddenly. At this point, in several other *Aralias*, the pedicel is dilated to a small obconical cupule.

[4] C. Koch, *Voch. Gärtn. u. Pfl.* (1859) 371.—Ott. et Sond. *Hamb. Gartenz.* (1862) 61.—Seem. *Journ. Bot.* vi. 57. Bentham and Hooker refer this plant to the genus *Fatsia*, as also *Panax horridus* Sm. type of a genus *Echinopanax* (Dcne. et Pl. *loc. cit.* 105) or *Oplopanax* (Miq. *Ann. Mus. Lugd.-Bat.* i. 16).

[5] Hook. f. *Fl. N.-Zel.* i. 95 (*Araliæ* sect.).—B. H. *Gen.* 935.—Seem. *Journ. Bot.* vi. 138.—*Stylbocarpa* Dcne. et Pl. *loc. cit.* 105.

hollow stem and fleshy orbicular, cordate, reniform or fan-shaped leaves, dentate or lobed and covered with hairs.

Some Asiatic or American *Aralias*, formerly named *Aureliana*[1] and often also referred to *Panax*,[2] as *A. trifolia*, *Ginseng* (fig. 185, 186), *quinquefolia*, differ from the preceding only in the number of their ovarian cells and styles, which is two, as in *A. papyrifera*. The floral pedicels are distinctly articulate, and the top of the ovary is convex.

In 1790 Loureiro distinguished as a genus under the name of *Plectronia*,[3] *Aralia trifoliata*,[4] a Chinese species whose petals are valvate and pedicels ordinarily, but not constantly,[5] without articulation. It is scarcely possible to separate it from *A. japonica*. The leaves, it is true, are trifoliolate and the gynæcium dimerous, but *A. pentaphylla*[6] of Japan, which may have four or five ovarian cells, and *A. ricinifolia*, with simple and palmatifid leaves, have been considered congeners. The latter has also been referred to *Brassaiopsis*,[7] which comprises *A. scandens*, *glomerulata*, &c., because these have styles, longer or shorter, united in the greater part of their length. The pedicels, like those of *A. japonica*, are not articulate. This is the only character which distinguishes them from *A. disperma*, *calyculata*, &c., types of a genus *Macropanax*,[8] which thereby approaches nearer *Aralia* proper. The albumen may, indeed, be ruminated in *Macropanax* and *Brassaiopsis*, but the fact is not constant, which detracts much from its value. The characters derived from the styles have scarcely a more absolute signification.[9] Nor can we consider otherwise than a section of *Aralia*, *Pentapanax*,[10] in which the floral pedicels are articulate or rarely not articulate, the petals often imbricate or more rarely valvate, and the styles short or elongate, but united in a

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[1] Lafit. *Mém.* ... *Ginseng* (1718) c. tab.; *Catesb. Carol. App.* (1743) 16, t. 16.—*Araliastrum* Vaill. *Serm.* 43.—*Aralicæ* sect. *Ginseng* B. H. *loc. cit.*

[2] Seem. *Journ. Bot.* vi. 52.—*Eupanax* Torr. et Gr. *Fl. N.-Amer.* i. 647.

[3] *Fl. Cochinch.* 162 (not L.).—*Acanthopanax* Seem. *Journ. Bot.* v. 238.—Miq. *Ann. Mus. Lugd.-Bat.* i. 10.—*Kalopanax* Miq. *loc. cit.* 16.—*Panax* subgen. *Acanthopanax* Dcne. et Pl. *loc. cit.* 105.

[4] Meyen. *Reis.* ii. 432.—*Zanthoxylon trifoliatum* L. *Spec.* 1445.—*Panax aculeatum* Ait. *Hort. Kew.* iii. 448.—*P. Loureirianum* DC. *Prodr.* iii. 252.—*Acanthopanax aculeatum* Seem.

[5] In certain specimens from Formosa, several flowers certainly had distinct or obscure articulations.

[6] Thunb. *Fl. Jap.* 128.—*Panax spinosa* L. f. *Suppl.* 441.—*Acanthopanax spinosum* Miq. *Ann. Mus. Lugd.-Bat.* i. 10.—Seem. *Journ. Bot.* v. 238.—Hook. *Fl. Ind.* ii. 726.

[7] Dcne. et Pl. *loc. cit.* 106.—C. Koch, *Vochenschr.* (1859) 364.—B. H. *Gen.* 945, n. 32.—Seem. *Journ. Bot.* ii. 290.

[8] Miq. *Fl. Ind.-Bat.* i. p. i. 763; *Ann. Mus. Lugd.-Bat.* i. 13.—Seem. *Journ. Bot.* ii. 293.—Hook. *Fl. Ind.* ii. 738.

[9] See H. Bn. *Adansonia*, xii. 147.

[10] Seem. *Journ. Bot.* ii. 294.—B. H. *Gen.* 936, n. 5.—Hook *Fl. Ind.* ii. 723.

common column for the greater part of their extent, and *Eleutherococcus*,[1] which differs from *Pentapanax* only in the constantly valvate prefloration of the corolla, the styles being equally united and the pedicels articulate. Except *Eleutherococcus*, most of the preceding types have pinnate leaves. This character is found in an American plant, *Sciadodendron excelsum*,[2] which has the imbricate corolla of the true *Aralia*, but is distinguished as a section of this genus by its floral verticils ordinarily more than pentamerous. Its ovary is 8–10- celled.

Thus determined,[3] the great genus *Aralia* appears very natural and includes some sixty species; they have been much multiplied.[4]

Aralidium pinnatifidum, a plant from the Indian archipelago and Malaya, as yet imperfectly known, approaches the true *Aralia* by its imbricate or nearly valvate corolla, but differs from it by its diœcious flowers and inflorescence in a very ramose compound cluster, the divisions of which are clothed with numerous small cymes (?) of flowers. The leaves are alternate, very variable in form, simple, entire or nearly so, or pinnatifid.

Near *Aralia* must be placed two genera from New Caledonia which have been ranged among the *Umbelliferæ* proper and which connect the latter with the *Araliæ*: they are *Myodocarpus* (fig. 191–193) and *Delarbrea*. In the former, the flowers have an inferior, bilocular ovary, compressed, like the fruit, perpendicular to the partition, and sessile petals distinctly imbricate. The two styles, geniculate near the summit, surmount a depressed stylopod. The dorsal margin of each of the ovarian cells is dilated in the fruit, especially below, to a large obtuse, membranous and veined wing. Finally, the two mericarps separate from each other, forming each a samara surmounted by two or three sepals and a style. In the seminiferous portion, the pericarp produces numerous vesicular reservoirs of odorous oleoresin

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[1] Maxim. *Primit. Fl. Amur.* 132.— Rupr. *Dec. Pl. Amur.* t. 7.—B. H. *Gen.* 941, n. 22.—Seem. *Journ. Bot.* vi. 161.

[2] Griseb. *Bonplandia* (1857), 7.—Seem. *Journ. Bot.* v. 285, t. 71.

[3] Sect. 13: 1, *Euaralia*. 2, *Dimorphanthus*. 3, *Fatsia*. 4, *Stilbocarpa*. 5, *Tetrapanax*. 6, *Aureliana*. 7, *Acanthopanax*. 8, *Echinopanax*. 9, *Brassaiopsis*. 10, *Macropanax*. 11, *Pentapanax*. 12, *Eleutherococcus*. 13, *Sciadodendron*.

[4] Vent. *Jard. Cels.* t. 41.—Torr. *Fl. N.-York*, t. 40.—Sieb. et Zucc. *Fl. Jap.* t. 25.—Jacquem. *Voy. Bot.* t. 81.—Hook. *Kew Journ.* iv. 53, t. 1, 2.—Wall. *Pl. As. Rar.* t. 137, 190 (*Hedera*).—Wight, *Icon.* t. 137 (*Hedera*). — Hombr. et Jacquin. *Voy. au Pôle Sud.* t. 2.—Hook. *Icon.* t. 747.—A. Gray, *Man.* (ed. 5) 198; *Unit. St. Expl. Bot.* i. (*Stilbocarpa*).—Chapm. *Fl. S. Unit. St.* 176.—Hook. f. *Handb. N.-Zeal. Fl.* 99 (*Stilbocarpa*).—Miq. *Fl. Ind.-Bat.* i. p. i. 749, 763 (*Macropanax*).—*Bot. Mag.* t. 1085, 1333, 1334, 4804 (*Hedera*), 4897.—Walp. *Rep.* ii. 420, 939; v. 925; *Ann.* i. 358; ii. 724; v. 83.

which project internally and deeply penetrate the albumen of the seed. At the summit of the latter is found a small embryo. *Myodocarpus* consists of trees or bushes, with alternate, simple or compound-pinnate leaves, accompanied by stipules but little prominent, adnate

Myodocarpus simplicifolius.

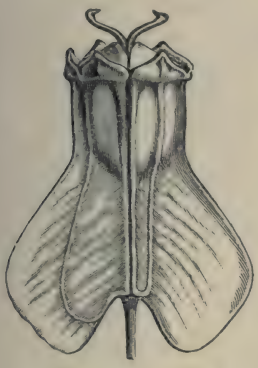

Fig. 192. Fruit (½).

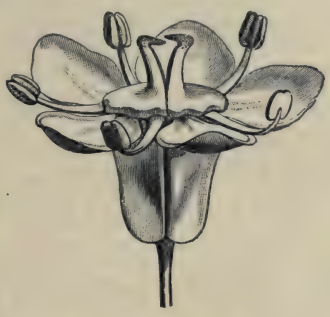

Fig. 191. Flower (½).

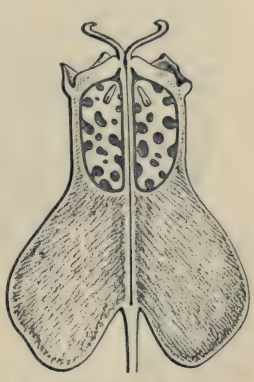

Fig. 193. Long. sect. of fruit.

to the base of the petiole, and the flowers are in a ramified cluster bearing numerous umbellules. With the habit, imparipinnate leaves and inflorescence of *Myodocarpus*, *Delarbrea* (fig. 194, 195) has the same flower except that the petals are more or less constricted at the base, the styles enlarged to a mass; in the fruit, ovoid or spherical and without wings, the vesicular oleoresinous reservoirs are less developed, and the seeds, very concave within, have margins more or less involute and regularly disposed longitudinal channels like those observed in so large a number of the true *Umbelliferæ*.

Delarbrea collina.

Fig. 194 Fruit (½).

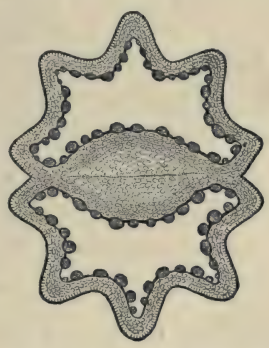

Fig. 195. Trans. sect. of fruit.

Pseudosciadium Balansæ, a New Caledonian shrub, with stem simple or nearly so, is intermediate between the two preceding genera and the *Umbelliferæ* proper, of which it has quite the flowers, but disposed

in enormous clusters of umbels. The petals are valvate, attenuate at the base and constructed like those of an Umbillifer, with an internal middle crest dividing them into two cavities each of which receives an anther cell. The flowers are borne on a pedicel with an articulation distant from the base of the ovary and are dimorphous as regards stylary branches. The latter are either very short, rectilinear (in flowers probably sterile), or long, thick above and stigmatiferous at the summit and along the margins of an internal longitudinal furrow. The two-celled ovary and the young fruit are compressed perpendicular to the partition; but at this age no trace of aliform dilatation is seen. The leaves are compound-imparipinnate.

Pseudosciadium Balansæ.

Fig. 196. Fertile flower without petals and stamens (♀).

Mackinlaya macrosciadea, a tree from tropical eastern Australia, is also one of the types which connect the *Araliæ* with the *Umbelliferæ* proper. A distinct tribe has been made of it because it has, like the two preceding genera, petals attenuate at the base, concave, divided internally by a middle crest. The acuminate summit is still more manifestly induplicate. They are, in fact, true petals of *Umbelliferæ;* the prefloration is valvate like that of *Pseudosciadium*. The inflorescences are decompound umbels; the ovaries two-celled; the fruit is a drupe of little thickness, but hard, didymous and much compressed perpendicular to the partition, and the leaves are digitate, with membranous stipules adnate to the base of the petiole. The floral pedicels are said to be articulate.

Having analogous petals with constricted base, ciliate margins and pointed summit, *Apiopetalum* (fig. 197–199), stubby shrubs of New Caledonia, present a habit and foliage quite exceptional in this group. Near the ends of the branches they have alternate simple, oval or oblong, dentate, penninerved, glabrous or hairy leaves, with umbels united in compound pedunculate corymbs, and floral pedicels without articulation. The ovary, in great part inferior and imbedded in the obconical concave receptacle, is 2–4-celled, and the style divides above into the same number of obtuse lobes. The

fruit is a nearly cylindrical drupe, with hard narrow 1–2-celled putamen. The seed is elongate and has not yet been examined at maturity.

Astrotricha and *Horsfieldia* are also two genera which have been

Apiopetalum velutinum.

Fig. 198. Flower (9).

Fig. 197. Floriferous branch.

Fig. 199. Fruit ($\frac{4}{1}$).

referred by some to the *Umbelliferæ* and by others to the *Araliaceæ*. In the former, which are Australian shrubs covered with stellate hairs, the leaves are also simple, entire and petiolate, and the inflo-

rescence is a ramified cluster of umbellules, with articulate pedicels. The obconical receptacle is surmounted by a depressed disk crenelate at the margin. There is no calyx; the petals are triangular, valvate, with stellate hairs, and the bilocular ovary is crowned with two slender stylary branches. The fruit is ovoid or obovate, with a nearly circular transverse section, or a little compressed perpendicular to the partition, drupaceous, but a little fleshy and enclosing two often concave putamens. *Horsfieldia* has the flower of *Astrotricha*, except that the stylopods represent a conical enlargement of the base of the style, and the two mericarps constituting the fruit, scarcely drupaceous, separate from each other at maturity like those of *Myodocarpus*. They are shrubs from Java, Japan and North America, with prickly stems and woolly or tomentose surfaces, peltate or cordate, palmatifid or palmatilobed leaves, and flowers in numerous small capituliform umbels, with involucres and sessile all along the axes of a large ramified spike.

One of the oldest genera of this group is *Schefflera*, established by Forster, in 1776, for an oceanic plant whose flowers (fig. 200) are pentamerous, with a concave, obconical or obpyramidal receptacle; the margin bears a very short calyx with dentiform sepals, five valvate petals and five alternate stamens. The ovary, inferior and surmounted by an undulate disk, contains from five to ten uniovulate cells, and is surmounted by a conical style of the same number of divisions varying in form with age. At first short, obtuse, indistinct, they increase in the fruit and take the form of branches with a somewhat enlarged stigmatiferous extremity, especially in the fertile flowers. The ovary becomes a drupe, the putamens of which, five to ten in number, enclose each a compressed seed. The two *Scheffleras* hitherto described inhabit New Zealand, the Viti isles and New Caledonia. They are glabrous shrubs with alternate, compound-digitate leaves, and flowers in ramified clusters, charged with numerous umbellules the floral pedicels of which are not articulate.

Schefflera digitata.

Fig. 200. Long. sect. of flower with short styles ($\frac{2}{1}$).

Heptapleurum (fig. 201) belongs to the same genus as *Schefflera*. When their flowers are pentamerous, as is very frequently the case, it is distinct (as a section) by only a single character: the shortness of the stylary lobes. The common portion of the style is very variable in length, sometimes very depressed or almost nil, sometimes extended in a very prominent cone. Such it appears, among others, in *Agalma*, whose inflorescence is racemiform, and in some species of *Astropanax*, whose flowers, like those of the true *Heptapleurum*, may be in small capitules on the axes of the inflorescence. In both the number of stylary lobes, as also of ovarian cells, may be equal to that of the petals, to which they are superposed, or rarely inferior. There are even *Scheffleras* of the *Heptapleurum* series whose flower has six, seven or more parts in each verticil.

Schefflera (*Heptapleurum*) *stellata*.

Fig. 201. Portion of inflorescence.

There are, on the other hand, species of *Astropanax* whose stylary branches are deeply separate. Nothing characteristic then distinguishes them from the true *Scheffleras*. When their flowers are in capitules, scarcely anything separates them from the American plants named *Sciadophyllum*, whose flowers may be pentamerous or may have a greater number (6–10) of parts, and whose petals are often more closely attached at the margins; or from *Brassaia*, trees from the tropical regions of Oceania, whose leaves are also digitate, whose stylary lobes are very short and whose flowers have as many as ten or twelve parts, like those of *Sciadophyllum conicum*. The only trait that permits their being made a section is the large development of the bracts, two to four, which accompany the flowers and form a sort of involucel. On the other hand there are species of *Heptapleuron* with unifoliolate leaves, which no important character permits being put in any other genus than *Dendropanax*, trees and shrubs from eastern Asia and America, whose leaves are simple, entire or 3–5-fid, and whose pentamerous flowers have stylary divisions in great part independent or united in a cone scarcely crenelate at the summit, with all intermediate degrees. It would violate natural affinity not to make the genus *Heptapleurum*, or rather *Schefflera*, such as we have defined it, a large group by concatenation the

various sections of which remain, moreover, but little different one from another.[1]

Didymopanax is from tropical America and closely resembles *Sciadophyllum*, of which it has generally the digitate leaves and floral pedicels without articulation. The gynæcium is dimerous, and the drupaceous fruit is much compressed perpendicular to the partition, widely didymous or nearly so. The inflorescences are ramified clusters of umbels and the flowers are sometimes polygamous. *Panax fragans*, from India and China, has become the type of a genus *Heteropanax*, whose flowers and fruit have an organization like that of *Didymopanax*. Here only the seeds have a deeply ruminate albumen (a character of little value), and the leaves are decompound-pinnate.

In New Caledonia there is another genus allied to *Schefflera*, whose leaves are partly compound-pinnate and partly simple, and whose flowers, disposed in simple or compound umbels, have thick pedicels. These flowers are unisexual, and the females have but one cell in the ovary surmounted by a conical disk, without apparent style. The drupaceous and monospermous fruit sometimes much resembles that of *Apiopetalum*. We have named this singular genus *Eremopanax* the analogue of which we shall find in *Mastixia* and *Arthrophyllum*, but it has not the ruminate seeds, and the floral pedicels, like those of *Schefflera*, are always without articulation. The putamen (fig. 202) is unsymmetrical or curved, traversed

Eremopanax otopyrena.

Fig. 202. Putamen (4/1).

[1] *Sciadophyllum*, which perhaps ought not to be preserved as a genus distinct from *Heptapleurum*, has four or five cells in the ovary, and sometimes two or three. We shall consider (provisionally at least) that the following types with 2–3-celled ovaries should be referred as sections to the genus *Schefflera*: *Meiopanax* (*Cussonia umbellifera* Sond.), a Cape plant with digitate leaves, pedicel not articulate, 5-merous valvate corolla, simple style with two indistinct stigmatiferous lobes; *Dipanax* (*Heptapleurum dipyrenum* H. Mann), a plant from Hawaii having the same flower with 2-3- more rarely 4-celled ovary, and imparipinnate leaves. *Sphærodendron angolense* Seem., whose gynæcium is dimerous and whose flowers are united in clusters, connects this genus with *Cussonia*. Its leaves are digitate.

The genus *Osmoxylon* is imperfectly known. It approaches *Schefflera* by its 4–5-merous flowers, non-articulate pedicels and valvate petals. Its flowers are in compound umbels of capitules and have a truncate entire calyx and a 4–10-celled ovary with very indistinct stigmatiferous lobes. They are glabrous trees from the Indian Archipelago, Malaya, and Philippine islands, with simple, or palmatifid, or multidigitate leaves.

by longitudinal furrows, or thinned below to a wing and dilated above to two lateral tubercles.

Gastonia (fig. 203) is also very analogous to certain *Schefflera*s of the section *Heptapleurum*, particularly to those which have more than five parts to the flower. The urceolate or turbinate receptacle bears on its margin a calyx very short or almost nil, entire or with 8–15 teeth, indistinct, and 8–15 thick triangular and valvate petals. There is the same number of alternate stamens inserted under the margin of a flat or slightly bulged disk which crowns the ovary, and this contains as many cells (or nearly so) as there are petals, to which they are superposed. In the true *Gastonia*, from Madagascar and the Mascarene isles, with compound pinnate leaves, the style, tolerably developed, is divided into as many recurved branches as there are cells in the ovary. In the species of the section *Trevesia*, which inhabit tropical Asia and Oceania and have digitate or palmatifid leaves, the style is short, stubby and divided into lobes much less distinct. In *Reynoldsia*, from the Sandwich Isles, which may have fifteen or sixteen ovarian cells and from six to thirteen stamens, the style is also thick, conical and channeled, but the leaves are compound-pinnate, as in the African species. In all these plants the pedicel is without articulation.

Gastonia (*Trevesia*) *sundaica*.

Fig. 203. Long. sect. of flower (½).

It is the same in *Gilibertia*, which may be considered the analogue, in tropical South America, of *Gastonia*, and which has very variable flowers. The receptacle is a thick tube the margin of which bears a short truncate or obscurely dentate calyx, a corolla of from five to ten triangular and valvate petals with a salient median ridge, as many stamens with apiculate and subcordate anthers. The ovary is 6–12-celled and the thick style is divided into the same number of small lobes. The fruit is a drupe with many putamens. They are glabrous trees from Peru and Brazil, with simple leaves, entire or nearly so, and terminal, simple or compound umbels (?).

Panax (fig. 204–207), as we define it, is connected by various characters with many of the preceding genera. By its more

complete types, that is those with as many ovarian cells as petals, it may be said to represent the woody *Aralias* with valvate corolla and the *Scheffleras* with articulate floral pedicels. Such is often the case with those named *Pseudopanax* and *Cheirodendron*. They have a short calyx, five or six valvate petals, as many stamens and ovarian cells. The size and form of their styles are very variable, and that often in the same species according as the gynæcium may assume a greater or less development. The stylary divisions are either very small, obtuse, erect, indistinct, or long-subulate, recurved, and between these extremes there may be every possible intermediate gradation. In one species also, the number of ovarian cells may descend to three or two. It is ordinarily so in *Nothopanax* (fig. 206, 207), which cannot be generally separated from *Polyscias*, particularly from those numerous in the Mascarene isles which have as many as ten or fifteen carpels; the number of petals and stamens may at the same time be augmented. In certain *Polyscias* and in *Eupteron* there are only five petals and the same number of superposed ovarian cells.

Panax (*Pseudopanax*) *valdiviensis*.

Fig. 204. Long. sect. of flower (4).

Panax (*Polyscias*) *pinnata*.

Fig. 205. Long. sect. of flower (4).

In *P. Boivini*, a species from Madagascar, of which a genus *Sciadopanax* has been formed, the ovary is bilocular and the styles are united in a conical mass by two small stigmatiferous lobes. The seeds have four large vertical furrows. In *P. Maralia*, from the same country, the styles, five in number, are reflexed like those of most *Polyscias*, and the seed is furrowed like that of *Sciadopanax*; it has been said to be ruminate, but this is certainly not constant. In Madagascar there is a *Panax* in which one cell in the ovary and fruit is aborted, and of which the genus *Cuphocarpus* has been made.

Thus defined the genus *Panax* comprises woody plants from all warm countries of the old world, with leaves almost always compound-pinnate, less frequently digitate and sometimes even simple or unifoliolate. The flowers are often polygamo-dicœcious.

Cussonia has a flower constructed nearly like that of *Panax* with dimerous gynæcium. The calyx is short, entire or undulate at the margin and the five sepals are valvate. The bilocular ovary (sometimes reduced to a single cell) is entirely or only partly imbedded in the cavity of the receptacle and surmounted by two recurved stylary horns. The fruit is drupaceous and the seeds have a ruminate albumen. In general the inflorescence is quite peculiar, spikelike and dense. Sometimes, however, the flowers are in umbellules borne by the divisions of a compound cluster. They are trees and bushes from the Cape, tropical western Africa, Madagascar, Abyssinia and Comoro isles, unarmed or prickly, whose leaves, often collected at the upper part of the stem, are digitate, palmate or bi-digitate, with lobes often deeply incised.

Panax (*Nothopanax*) *arborea.*

Fig. 206. Tricarpellar flower (8).

Fig. 207. Long. sect. of flower.

The Ivies (fig. 208–212) have also nearly the flower of *Panax*, especially those which have as many ovarian cells as petals, and almost always the ruminate albumen of *Cussonia*. In the common Ivy, the floral receptacle is obconical and bears on its margin five small indistinct dentiform sepals; five triangular and valvate petals, divided internally by a middle ridge into two cavities which receive each a half-anther in the bud; five alternate stamens, the filaments of which are inserted in an opening in the margin of the epigynous flat-conical disk which surrounds the style, and whose anthers are bilocular, introrse, oscillant. The style is conical, divided at the summit by five small furrows into five indistinct stigmatiferous lobes, and the inferior ovary has five oppositipetalous cells. At the top of the internal angle is inserted a descending ovule, with micropyle exterior and superior, above which the funicle thickens to a short obturator. The fleshy fruit encloses a variable number of seeds. The Ivy is a shrub which clings to trees and stones by means of

hooks or rootlets and has alternate-distichous lobed leaves. On those of its branches which are free and whose leaves, quincuncially

Hedera Helix.

Fig. 208. Branch with hooks.

Fig. 210. Long. sect. of flower (4).

Fig. 209. Inflorescences.

alternate, are entire, the inflorescences are terminal and in clusters of umbellules, terminated by a more aged umbellule. The pedicels, articulate at the base, are inserted in the axil of small bracts. To this genus has been referred as a section, *H. australiana*, proposed also as a distinct genus under the name of *Kissodendron*, because its leaves are compound-pinnate. In *H. discolor*, *argentata*, *septemnervia*, *capitata*, *xalapensis*, *jatrophæfolia*, &c., American species, of which the genus *Oreopanax* has been made,

Hedera Helix.

Fig. 211. Seed (4).

Fig. 212. Long. sect. of seed.

the leaves are simple, palmatifid or compound-digitate, and the styles are either united to a small extent or free to the base. The albumen is often, but not constantly, ruminate.

Curtisia faginea (fig. 213–217), a small tree from the Cape, ordinarily referred to the family of the *Cornaceæ*, differs in habit and

Curtisia faginea.

Fig. 216. Fruit (½).

Fig. 213. Flower (2/1).

Fig. 215. Long. sect. of flower.

Fig. 217. Trans. sect. of fruit.

foliage from *Hedera*, but has its flower, constructed on the type 4. Its obconical receptacle lodges in its cavity the inferior ovary with four oppositipetalous cells, and bears on its margin four small sepals, four petals normally valvate and four stamens. The conical summit of the ovary is covered by a coloured glandular disk enclosing the base of the style which is erect and divided only at the summit into four small stigmatiferous lobes. In the internal angle of each ovarian cell is a descending ovule with micropyle superior and exterior. The fruit is a small drupe with a four-celled putamen and descending seeds; the abundant albumen surrounds an elongate embryo. *Curtisia* has opposite, persistent, oval-oblong, penninerved, dentate coriaceous leaves, pubescent beneath, and its flowers are in a terminal ramified cluster, charged with biparous cymes, with articulate pedicels.

Curtisia faginea.

Fig. 214. Diagram.

The *Merytas* (fig. 218, 219) are also anomalous *Aralieæ*, but from another point of view: they have diœcious flowers. The males (fig. 218), as well as the females, have a simple perianth formed of a variable number of valvate petals. The stamens are fertile and alternate with the parts of the perianth. They are inserted on a little-developed obconical receptacle and have no gynæcium. The petals of the females are equally variable in number and surmount

an inferior ovary, but with no trace of calyx (fig. 219). The stamens, which alternate with the petals and are the same in number, have generally a distinct filament and anther; but the latter is sterile. The fruit is a drupe with a variable number of monospermous putamens, succeeding an ovary surmounted by as many recurved stamens as there are cells; the latter contain each a descending ovule, with micropyle superior and exterior and funicle slightly thickened above the micropyle, as in many *Araliæ*. They are glabrous trees of Oceania, especially abundant in New Caledonia, with large simple penninerved leaves, and inflorescences in often very ramified clusters, composed of small capitules frequently with tolerably well-developed membranous bracts.

Meryta coriacea.

Fig. 218. Male flower (♂).

Meryta coriacea.

Fig. 219. Long. sect. of female flower (♀).

Arthrophyllum (fig. 220) comprises plants of Malaya and the Indian archipelago, the principal character of which is a unilocular and uniovulate ovary like that of *Eremopanax;* but the albumen is deeply ruminate. The flowers are pentamerous and have a short style with terminal stigma. The fruit is regularly ovoid or spherical. The leaves are generally alternate, pinnate or bipinnate, and the flowers are united in simple or compound umbels often surrounded by one or more simple leaves. The pedicels are sometimes constricted and more or less distinctly articulate under the flower.

Arthrophyllum javanicum.

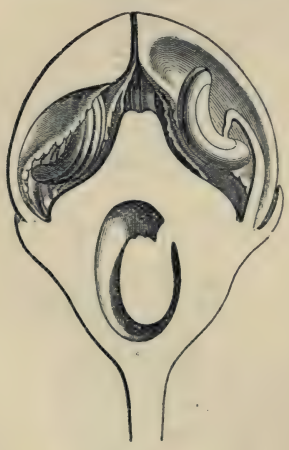

Fig. 220. Long. sect. of flower (♀).

Mastixia, generally referred to other families than *Arthrophyllum*, is either congeneric, or so analogous that, in our opinion, it must be placed very near. The habit, however, differs considerably: it has simple entire leaves, turning black by desiccation, opposite or alternate, and flowers in

ramified clusters of cymes, with articulate pedicels. The calyx is gamosepalous, 4–5-dentate; the petals are triangular and valvate; and the unilocular and uniovulate ovary is surmounted by a thick style with umbilical summit and surrounded at the base by a large epigynous 10-lobed disk. The fruit is an elongate drupe the woody putamen of which has on one side an exterior furrow corresponding to a sort of vertical incomplete false partition, to which is applied the corresponding margin of the seed. On this side the albumen has a deep furrow and lodges, above, a small embryo with foliaceous cotyledons, but it is not ruminate like that of *Arthrophyllum*.

Plerandra (fig. 221, 222) is exceptional in this family on another ground: the androcium is not isostemonous. It has a superior calyx, more or less developed, and five or more triangular and valvate petals, more or less adherent, with a number of stamens many times that of the petals. In *Plerandra* proper the number of these stamens is indefinite and they are pluriseriate. The leaves are compound-digitate, and the ovary has 12 to 15 cells, surmounted by a stumpy and truncate style with little-pronounced stigmatiferous lobes. In *Tetraplasandra*, which we can make only a section of the genus, the stamens are indefinite in number, simple or sometimes bifurcate; the ovary is 6–10-celled, with the styles united in a dentelate conical mass, and the leaves are compound-pinnate. In those named *Bakeria*, with digitate leaves, we find some fifteen stamens, an ovary of only five cells and a style very flat with five indistinct lobes; in *Triplasandra*, from ten to eighteen stamens, five or six ovarian cells with as many petals, and compound-pinnate leaves; in *Tubidanthus*, digitate leaves, five very adherent petals and a very great number of pluriseriate stamens and ovarian cells, with very small stigmatiferous lobes.

Plerandra (*Nesopanax*) *vitiensis*.

Fig. 221. Flower (2/1).

In *P. vitiensis*, of which a genus *Nesopanax* has been made, not only are the stamens very numerous, but they are evidently disposed in five alternipetalous groups. *P. Vieillardi*, with us type of a

section *Pentadiplandra*, the leaves are also compound-digitate. The ovary has five to seven ovarian cells surmounted by as many small stigmatiferous tubercles, and the androecium is formed of five pentadelphous stamens or of five alternipetalous filaments each bearing an anther with four introrse and primarily parallel cells (fig. 222).

Plerandra (*Pentadiplandra*) *Vieillardi*.

Fig. 222. Long. sect. of flower (1).

Thus defined, this genus consists of woody plants, unarmed trees or shrubs, with flowers in compound umbels, nearly always erect stems, climbing in *Tupidanthus*, from India, whilst the other known species are from the Sandwich, Feejee, New Caledonia and neighbouring isles.

The form of inflorescence of the *Umbelliferæ*[1] attracted the attention of early botanists. Thus, DODOENS[2] united them in the fifth class of his first 'pemptade.' CLUSIUS[3] places them in the same book with the *Compositæ* and Ferns. CESALPIN[4] makes of them a separate class, as do also DALECHAMP[5] and many other authors at the close of the sixteenth century. LINNÆUS[6] conceived the idea of distinguishing an Order of *Umbelliferæ* which has been retained generally by his successors, especially, in France, by B. DE JUSSIEU,[7] ADANSON[8] and A. L. DE JUSSIEU.[9] ADANSON placed the *Araliecæ* known to him in the same family and in a tribe of *Ginsen*. A. L. DE JUSSIEU separated them under the title of a distinct order[10] in consequence of an error, believing the seeds of the *Umbelliferæ* naked and those of the *Araliecæ* furnished with a pericarp. The fruit of these plants was then very imperfectly known. CUSSON,[11] then GÆRTNER,[12] showed

[1] *Umbellatæ* T. *Inst.* 304.—*Sciadophytæ* NECK. *Elem.* i. 162.—*Umbellaceæ* LINDL. *Key* (1835), n. 11.—*Apiaceæ* LINDL. *Veg. Kingd.* (1846) 773, Ord. 296.

[2] *Pempt.* (1552).

[3] *Rarior. et Exot.* (1576).

[4] *De Plantis Libri XVI* (1583).

[5] *Hist. Gen. Plantar.* (1587).

[6] *Prælect. Ord. Nat.* (ed. GIES.) 508.

[7] Ex A. L. JUSS. *Gen.* lxv.

[8] *Fam. des Pl.* (1763) ii. 102, sect. 8.

[9] *Gen.* (1789) 218, Ord. 2.

[10] *Loc. cit.* 217, Ord. 1.

[11] Ex J. (*Extrait d'un Mémoire sur les Ombellifères, Hist. Soc. Roy. Méd.* (1782).

[12] *De Fruct. et Semin.* (1789).

the importance of its study in this family. SPRENGEL [1] and HOFFMANN [2] especially had recourse to it in establishing their classification of the *Umbelliferæ;* so also had KOCH,[3] ten years later. Then A. P. DE CANDOLLE published his "Observations on the Family of the Umbelliferæ," [4] and a description of the family in his "Prodromus." [5] He there admits 157 genera, and preserves the *Araliaceæ*[6] as a distinct family with only 13 genera. The *Umbelliferæ* proper he divided into seventeen tribes, distributed in three sub-orders, now inadmissible, *Orthospermæ*, *Campylospermæ* and *Cœlospermæ*. About ten years later ENDLICHER,[7] adopting the same divisions, with the same number of genera of *Araliaceæ*,[8] enumerated 195 genera of *Umbelliferæ*. Ten years since BENTHAM and HOOKER [9] retained only 153 genera of *Umbelliferæ* and 38 of *Araliaceæ*,[10] whilst B. SEEMANN [11] admitted 43 in the latter, though he did not include the plants with imbricate petals nor those with a unilocular ovary. We now reduce the total number of genera to 113 of which 25 belong to the *Aralieæ*.[12] We have arrived at this result by uniting numerous types of *Umbelliferæ* which, in our opinion, are separated by no generic difference; the same among the *Aralieæ*. In the latter only we have established some new genera, as *Apiopetalum*, *Pseudosciadium* and *Eremopanax;* [13]

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[1] *Plant. Umbell. Prodr.* (1813).

[2] *Syllab. Pl. Umbell.; Gen.* (1814).

[3] *Mém. Acad. Nat. Cur.* (1824).

[4] *Coll. Mém.* (1829). A complete history of this family will be found in this memoir.

[5] iii. (1830) 55, Ord. 92.

[6] *Loc. cit.* 251, Ord. 93.

[7] *Gen.* 762, Ord. 162.

[8] *Loc. cit.* 793, Ord. 168.

[9] *Gen.* 859, 1008, Ord. 80.

[10] *Loc. cit.* 931, 1009, Ord. 81.

[11] *Revis. Hederac. Journ. of Bot.* ii.-vi. (1864–1868).

[12] Without counting those which are too imperfectly known to be retained or classed definitely:

1. *Chamæle* (MIQ. *Ann. Mus. Lugd.-Bat.* iii. 59). This genus, represented by a single Japanese species (*C. tenera*), is considered by the author as belonging to the *Seselineæ*. The unripe fruit we have examined was compressed perpendicular to the partition; which would ally the plant to *Carum*.

2. *Asciadium* (GRISEB. *Cat. Pl. Cub.* 118).

3. *Galbanum* (DON, *Trans. Linn. Soc.* xvi. 603;—ENDL. *Gen.* n. 4486). A genus created for a Persian plant which produced the galbanum, whose fruit, alone known, having mericarps compressed parallel to the partition and having at the same time primary and secondary ridges, could not be assimilated to any of the genera we have studied.

4. *Opoidia* (LINDL. *Bot. Mag.* xxv. [1839] 64). A genus likewise established for a galbanum plant, considered by BENTHAM and HOOKER (*Gen.* 920) very like a *Peucedanum*, left by BOISSIER (*Fl. Or.* ii. 1089) among those of uncertain place. However, after remarking that the mericarps have three obtusely angular primary ridges each containing a thin vitta, and flat furrows to each of which corresponds a wide and deep vitta, with four commissural vittæ, the author is inclined to think that this Persian herb probably belongs to a group of *Smyrnieæ*.

5. *Platyraphe* (MIQ. *Ann. Mus. Lugd.-Bat.* iii. 56) "*Amminea.*"

[13] *Adansonia*, xii. 130, 133, 158 (1878).

we have added *Curtisia*[1] and *Mastixia*,[2] but excluded *Helwingia*,[3] which we have referred to the *Cornaceæ*. The total number of species is about 1900.

In all these plants some common characters are constant, all of the highest value, as: the concave form of the floral receptacle; the independence of the petals; the presence (at adult age) in each ovarian cell of a single descending ovule,[4] with micropyle exterior and superior; the existence in the seed of a horny or fleshy albumen and an embryo shorter, generally much shorter, than the albumen.[5]

Other characters are very frequent and very important, without however being constant. Among others we may mention: compound leaves;[6] the herbaceous consistence of the stems;[7] the two cells of the ovary,[8] and the fruit consisting of a diachene[9] in the *Umbelliferæ* proper; the presence in the pericarp of reservoirs of oleoresinous substances[10] which give the fruits their aromatic

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[1] *Adansonia*, iii. 334; xii. 163.

[2] *Bull. Soc. Linn. Par.* 159.

[3] See p. 69, 80; *Bull. Soc. Linn. Par.* 137.

[4] At first, as Payer has shown, in the types examined, there are two ovules in each cell, both descending, or one more or less ascending. The latter may persist for a longer or shorter time or even to maturity in plants with very large ovarian cells, and also in some others. We have observed this many times in *Eryngium*, *Peucedanum*, and *Trachymene*.

[5] It may be as much as half the length of the albumen or nearly so as, for example, in some *Ferulas*, *Curtisia*, *Palimbia* (fig. 90, p. 100), &c.

[6] Not unfrequently simple in the *Araliæ*, more rarely in the true *Umbelliferæ*, particularly in *Buplevrum*, *Eryngium*, and a great many *Hydrocotyleæ*; reduced to cylindrical petioles, often transversely partitioned, in *Cruntzia*, *Hohenackeria*, *Rhyticarpus*, &c.

[7] Woody in some species of *Tornabenia*, *Peucedanum*, *Eryngium*, *Bupleurum*, *Angelica*, *Siebera*, and in most of the *Araliæ*, or they may even become climbing and very long, or stumpy, little divided or simple so that at a distance these plants resemble palms in habit. The structure of these stems has been partially studied by several authors: G. de Buzar, *Ann. Sc. Nat.* ser. 2, i. t. 6.—Jochmann, *De Umbellif. Struct. et Evol. Nonnulla* (Breslau, 1855).—Link, *Icon. Anat. Bot.* (1837) fasc. x. 2, 6; xii. 1-3.—C. H. Schultz, *Nov. Acta Nat. Cur.* (1841), xviii. Suppl. 2, t. 21, 22.—Hartig, *Bot. Zeit.* (1859) 96.—Unger, *Beitr. zur Kenntn. Par. Pfl.* (1841) t. 6 (*Hedera*).—A. Gray, *Introd.* (1858) 118 (*Aralia*). Trécul has most minutely examined the structure of these plants, chiefly with regard to the distribution and organization of the sap reservoirs, both in the *Umbelliferæ* (*Comp. Rend. Acad. Sc.* lxiii. 154, 201, 247; *Adansonia*, vii. 118) and in the *Araliæ* (*Compt. Rend.* lxi. 1163; *Adansonia*, viii. 102).

[8] The abnormal flowers with three ovarian cells are very rare; we have seen them only in some specimens of *Conium*, *Ligusticum* and *Peucedanum*. In the *Araliæ* they often equal or exceed the number of petals, since some *Pleurandras* are said to have nearly a hundred. But it is also known that there are many *Araliæ* with a bilocular ovary.

[9] The *Araliæ* with dimerous fruit have also been distinguished from the true *Umbelliferæ* because their carpels do not separate at any age nor quit an interposed columnella. But *Myodocarpus*, whose achenes are not detached at maturity, is inseparable from *Delarbrea* which does not present this peculiarity. So also *Horsfieldia* and *Astrochiche*, formerly placed among the *Umbelliferæ* and scarcely distinct from some forms of *Panax*. There are, moreover, many true Umbellifers without carpophore.

[10] Especially studied by Trécul (see p. 87, note 8), these reservoirs or vittæ represent secreting canals. See also Sachs, *Text Bk. of Bot.* 73, 110.

properties;[1] the alternation of the leaves,[2] and absence of stipules;[3] the isostemony of the andrœcium;[4] the presence of stylopods or an epigynous disk; the inflorescence in simple or compound umbels.[5]

The other characters, eminently variable and establishing generic and tribal distinctions and divisions into sub-orders are: the bracts forming the involucres and involucels; the form of the fruit and the direction in which it is compressed, whether parallel or perpendicular to the partition; the presence of both primary and secondary ridges or of one without the other, and developing or not into wings; constriction or not at the commissure, narrow or wide in consequence; the number and position of vittæ whether in the furrows or in the substance of the ridges, irregular or interrupted or even disappearing altogether; the absence or presence of a carpophore which may be single or double; the form and size of the stylopods; the configuration of the ventral face of the seeds, flat, or traversed by a vertical median furrow, broadly concave or involute at the margin. Of the very diverse classifications based upon these differences and giving to one or another a very variable relative importance, in still further simplication, we have preferred that of ADANSON, based upon the form of the fruit,[6] the characters of the flower and the envelopes of the inflorescence, that is, involucres and involucels, and comprising eight sections. By uniting two of these in one place, and three in another, and by adding the *Hydrocotyleæ* and *Eryngieæ*, we form six series with the following distinctive characters:

I. DAUCEÆ.[7]—Fruit with primary and secondary ridges more or

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[1] Often also to the stems, &c.

[2] Often opposite in *Bowlesia*, *Spananthe*, and other *Hydrocotyleæ*, several species of *Arthrophyllum*, *Panax*, *Hohenackeria*, very rarely verticillate. Some *Gastonias* have 3–5 folioles at the same level of the leaf-rachis.

[3] Many *Araliaceæ* have a dilatation of the petiole, sometimes with an axillant scale, superposed to the furrow of the petiole. *Bowlesia*, *Mulinum*, *Azorella*, *Hydrocotyle*, and several other plants of the same series have scarious or squamiform stipules (?). In *Aralia papyrifera*, there is on each side of the top of the sheath, a long subulate stipule.

[4] It disappears only in *Plerandra*.

[5] Many so-called umbels are cymes. The latter are more frequent in the *Araliaceæ* than in other *Umbelliferæ*. In one and the same genus as *Hydrocotyle* (see p. 141), umbels or cymes may be observed according to the species.

[6] At this time considered as seeds.

[7] *Daucineæ* KOCH, *Umbell.* 76.—ENDL. *Gen.* 784, trib. 12.—*Laserpitieæ* B. H. *Gen.* 929, trib. 9.

less prominent, often developed to wings entire or lobed, dentate or pointed. Vittæ under the secondary ridges, developed or indistinct. —Annual or perennial herbs, rarely frutescent or arborescent, with compound or decompound leaves and flowers in compound umbels.—9 genera.

II. ECHINOPHOREÆ.[1]—Fruit ovoid, unilocular, woody (accompanied or not by a rudiment of the other sterile carpel), surrounded by indurated pedicels and more or less adnate to the infertile surrounding flowers. Primary ridges only visible and little developed. Vittæ variable in number.—Perennial herbs, often rigid, spinescent, with compound or decompound leaves, flowers in decompound umbels, umbellules containing a central female flower, the surrounding flowers male.—1 genus.

III. PEUCEDANEÆ.[2]—Fruit dicarpellar, with only primary ridges, much compressed parallel to the partition, or little compressed and with a transverse section circular or nearly so (*Seselineæ*), commissure generally wide, lateral ridges forming vittæ or commissural wings distinct (*Seselineæ*), or closely connected till the separation of the mericarps (*Eupeucedaneæ*).—Plants generally herbaceous, with leaves ordinarily compound or decompound and umbels almost constantly compound.—27 genera.

IV. CAREÆ.[3]—Fruit dicarpellar, with only primary ridges, more or less compressed perpendicular to the partition.—Plants whose organs of vegetation and inflorescence are generally similar to those of the *Peucedaneæ*.—33 genera.

V. HYDROCOTYLEÆ.[4]—Fruit dicarpellar or more rarely with only

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—*Thapsieæ* KOCH, *Umb.* 73.—DC. *Prodr.* iv. 202, trib. 4.—*Cumineæ* KOCH, *Umb.* 81.—ENDL. *Gen.* 783, trib. 10.—*Elæoselineæ* KOCH, DC. *Prodr.* iv. 215.—ENDL. *Gen.* 785, trib. 13.—*Caucalineæ* KOCH, *Umb.* 79.—ENDL. *Gen.* 785, trib. 14.—B. H. *Gen.* 925, trib. 8.—*Diplozygiæ* B. H. *Gen.* 863, ser. 3.

[1] B. H. *Gen.* 881, trib. 4.

[2] DC. *Prodr.* iv. 170.—ENDL. *Gen.* 778, trib. 8.—B. H. *Gen.* 917, trib. 7.—*Angelicæ* KOCH, *Umb.* 98.—ENDL. *Gen.* 778, trib. 7.—*Seselineæ* KOCH, *Umb.* 102.—ENDL. *Gen.* 773, trib. 5.—B. H. *Gen.* 900, trib. 6.—*Pachapleureæ* LEDEB. *Fl. Alt.* i. 295.—ENDL. *Gen.* 777, trib. 6.

[3] *Carvi* ADANS. *Fam. des Pl.* ii. 94.—*Ammineæ* KOCH, *Umb.* 114.—ENDL. *Gen.* 768, trib. 4.—B. H. *Gen.* 882, trib. 5.—*Scandicineæ* KOCH, *Umb.* 130.—ENDL. *Gen.* 786, trib. 15.—*Smyrneæ* KOCH, *Umb.* 133.—ENDL. *Gen.* 788, trib. 16.—*Haplozygiæ* B. H. *Gen.* 862 ser. 2 (part).

[4] DC. *Prodr.* iv. 58.—ENDL. *Gen.* 763, trib. 1.—B. H. *Gen.* 872, trib. 1.—*Mulineæ* DC. *Prodr.* iv. 78.—ENDL. *Gen.* 765, trib. 2.—B. H. *Gen.* 875, trib. 2.—*Saniculeæ* KOCH, *Umb.* 138.—ENDL. *Gen.* 766, trib. 3.—B. H. *Gen.* 878, trib. 3.—*Heterosciadiæ* B. H. *Gen.* 862, ser. 1.

one fertile carpel. Vittæ none or not situate in the furrows.—Herbs with simple or compound leaves, inflorescence in cymes or in simple or irregularly compound umbels.—18 genera.

VI. ARALIEÆ.[1]—Fruit 2-∞ -celled, carpels not generally separable. Pericarp rarely dry, more generally fleshy, often drupaceous. Ridges rarely developed, often nil. Vittæ none or replaced by irregularly scattered oleoresinous reservoirs. Androecium isostemonous or rarely 2-plo-∞ -stemonous.—Plants generally woody, erect or climbing, with simple, pinnate, digitate or decompound leaves. Inflorescences simple or compound, in cymes, in clusters, in spikes, in corymbs, in capitules or in umbels.—25 genera.

AFFINITIES.—The *Umbelliferæ* have affinities, chiefly by the *Aralieæ*, with the *Cornaceæ*, the *Rubiaceæ* and the *Rhamnaceæ*. The herbaceous types, with compound and decompound leaves and inflorescences in compound umbels appear clearly distinct, even in their external characters, from these families. Not so those with simple leaves and fleshy fruit as are a great many *Aralieæ*. Between these and the *Cornaceæ* the only absolute difference is the position of the raphe, dorsal in the *Cornaceæ*, ventral in the *Umbelliferæ*. Among the *Rubiaceæ*, there are analogues of the *Cornaceæ* which differ only by their gamopetalous corolla; but it is the *Sambucineæ* which, with their simple or compound leaves, drupaceous fruit and descending ovules, most closely resemble either the *Corneæ* or the *Aralieæ*. In like manner the Umbelliferous types differ from the *Rhamnaceæ* in general appearance. But there are many genera of the group *Hydrocotyleæ*, whose habit, foliage and down become those of *Pomaderris* or neighbouring genera.[2] The flower must then be analyzed to see that it has neither the oppositipetalous stamens, nor the ascending ovules of these *Rhamnaceæ;* but these traits prove a certain affinity between the two groups.

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[1] *Araliæ* J. *Gen.* 217.—*Araliaceæ* J. *Dict. Sc. Nat.* ii. 348.—DC. *Prodr.* iv. 251, Ord. 83.—ENDL. *Gen.* 792, Ord. 163.—LINDL. *Introd.* ed. 2, 25; *Veg. Kingd.* 780, Ord. 297.—B. H. *Gen.* 931, Ord. 81.—*Hederaceæ* BARTL. *Ord. Nat.* 237.—SEEM. *Journ. Bot.* ii.-vi.

[2] See *Adansonia*, v. 261.

Geographical Distribution.[1]—The Umbellifers of the series *Dauceæ*, *Peucedaneæ*, and *Careæ*, are generally plants of the temperate regions of the northern hemisphere both old and new world. The *Hydrocotyleæ*, met with in all warm and temperate countries, are more especially plants of Oceania and Andean America, particularly southern. The *Echinophoreæ* are principally Levantine. The *Aralieæ* belong to almost all tropical regions of both worlds. Europe possesses 46 genera, including the Ivy. The Levant flora, according to Boissier,[2] numbers 630 species. To tropical and sub-tropical Africa belong most of the true Umbillifers with erect and woody stems, resembling those of the *Aralieæ*. Thus the *Tornabenias* of the sections *Monizia* and *Melanoselinum* are from Madeira;[3] the ancient *Bubon Galbanum* from the Cape; *Heteromorpha* from eastern tropical and southern Africa. To the Cape and neighbouring regions belong *Hermas*, *Rhyticarpus*, *Lichtensteinia*, *Anesorhiza*, *Polemannia*, *Pappea*, and *Arctopus*. *Aciphylla* is chiefly from New Zealand, especially the most curious forms. The others are from Australia, the exclusive home of *Siebera*, *Actinotus* and *Xanthosia*, *Astrotriche* and *Mackinlaya*. *Apiopetalum*, *Pseudosciadium*, *Myodocarpus*, *Delarbrea*, and *Eremopanax* grow only in New Caledonia. All the *Plerandras* except *Tupidanthus*,[4] *Aralieæ* with pleiostemonous androœcium, are Oceanic plants, as are also *Horsfieldia* and *Meryta*. *Phellopterus* has been found only on the southern shores of China and Japan; *Klotzschia*, only in Brazil; *Tauschia*, *Spananthe*, and *Arracacia* in the Andean region; *Laretia* in Chili; *Musenium*, *Erigenia*, and *Apiastrum* in North America; *Petagnia* in Sicily. The types limited to the Levant are numerous, the principal being *Exoacantha*, *Szovitzia*, *Vicatia*, *Oliveria*, *Rhabdosciadium*, *Thecocarpus*, *Polyzygus*, *Zozimia*, *Artedia*, *Psammogeton*, and *Pyramidoptera*. Of the 113 genera retained by us, only twelve belong exclusively to America. Adanson remarked that the plants of this family shunned the torrid zone; the only exceptions are some *Aralieæ*. The country in which they are least common is Nigritia, where they represent only $\frac{1}{470}$ of the vegetation, and those where they are relatively most abundant are: the Falkland islands, Algeria, Germany,

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[1] Endl. *Enchirid.* 381.—Lindl. *Veg. Kingd.* 775.—Lecoq. *Géogr. Bot.* vi. 255.—A. DC. *Géogr. Bot. Rais.* 502–511, 569, 663–666, pass.

[2] *Fl. Or.* ii. 820–1091 (1872).

[3] Lowe, *Man. Fl. Mader.* 365.

[4] From the East Indies.

Ireland and Italy, where they form about $\frac{1}{20}$ of the entire flora. *Anisotome*, *Stilbocarpa*, *Azorella*, and *Apium* are found near the south pole. In Lapland the *Umbelliferæ* are said to form $\frac{1}{47}$ of the vegetation. The deadly Hemlock grows in the Somoid district as far north as 72°, and the Goutweed (*Æzopodium*) to 70°, the northern limit of *Carum* and some *Pimpinellas*. *Œnanthe crocata* and *Phellandrium* grow in Finland, to 60°, and *Angelica Sylvestris* as far as Cape North. *Imperatoria* is found in Iceland to 65° and the Cow-parsnip (*Heraclium Sphondylium*) in Norway to 62°, the extreme limit of the common Carrot, of *Daucus* (*Torilis*) *Anthriscus* and of *Chærophyllum temulum*.

Uses.[1]—The *Umbelliferæ* are generally more or less odorous, aromatic. They often contain an essential oil and a resinous matter, the former was held to predominate in the root, the latter in the fruit. The stem may contain both principles, though generally in smaller quantity, and likewise, mucilaginous and saccharine substances, also found in several roots. To these are not unfrequently added, either in all parts of the plant, or in the subterranean portions, or in the leaves or fruit, narcotic acrid alkaloids which render some species poisonous. In the *Aralicæ*, where these alkaloids are most frequently absent, a bitter or astringent and tonic principle is found, in addition to the resinous matter and essential oil. Thence are derived most of the properties, sometimes very remarkable, which characterize the plants of this family. Among the aromatic *Umbelliferæ*, the most common are the Fennel (*Fœniculum vulgare*), the Chervil (*Chærophyllum sativum*) and the Parsley (*Carum Petroselinum.*[2])

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[1] Endl. *Enchirid.* 382.—Lindl. *Veg. Kingd.* 775; *Fl. Med.* 33.—Guib. *Drog. Simpl.* ed. 6, iii. 199–251.—Rosenth. *Synops. Pl. Diaphor.* 524, 1138.—Flück. et Hanb. *Pharmacogr.* 264–297.

[2] *Apium Petroselinum* L. *Spec.* 379.—Hayn. *Arzn. Gew.* vii. t. 25.—*A. vulgare* Lamk.—*A. tenuifolium* Riv.—*A. latifolium* Mill. (not Poir.)—*A. crispum* Mill. *Dict.* n. 2.—*Petroselinum sativum* Hoffm. *Umb.* i. 78, t. 1, fig. 7.—Koch, *Umb.* 127.—Nees, *Off. Pfl.* t. 21.—DC. *Prodr.* iv. 102, n. 1.—Guib. *loc. cit.* 223, fig. 622.—Berg. et Schm. *Off. Gew.* t. 24 *d.*—Rosenth. *op. cit.* 529.

The last (fig. 120), believed to be a native of the Mediterranean region, and cultivated everywhere, is used as a condiment, and furnishes one of the *five aperitive roots*. It belongs to the same genus as the Caraway[1] (fig. 118, 119), whose odour is very strong and aromatic, and which is used for perfuming spiced bread,[2] pastry, and many other aliments and drinks, and is employed in medicine as a stomachic, digestive, and carminative. Its native country is uncertain: some make it come from the East, others from Great Britain.[3] *C. nigrum* (*Zeena Seah*) and *gracile* Royle, of India, have the same uses as the Caraway. *C. Bulbocastanum*[4] has swollen subterranean portions, edible for animals and even for man, called Earth Chestnuts. The fruit is stomachic, and is also used to season bread.[5] Anise is *C. Anisum*,[6] believed to be of African origin, and is cultivated for the use of pharmacists, confectioners, and liqueur makers, chiefly in Touraine, Malta, and Spain. Its fruit (fig. 121) contains a fixed oil and a crystalizable essence. It is erroneously substituted, in many preparations, for *Illicium anisatam*, of which it has to a certain extent the odour and taste, but with a mixture of acridity which may render it noxious. *C. Panatjan*[7] is considered a good aphrodisiac and diuretic medicine in Java. *C. Saxifraga*[8] and *magnum*,[9] French

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[1] *Carum Carvi* L. *Spec.* 378 (see p. 117, note 2).—Nees, *Off. Pfl.* t. 17.—Hayn. *Arzn. Gew.* t. 19.—Guib. *loc. cit.* 226, fig. 624.—Lindl. *Fl. Med.* 37.—Berg et Schm. *Off. Gew.* t. 25 *c*.—Flück. et Hanb. *Pharmacogr.* 271.

[2] Often confounded with Cumin, on account of its German name *Kümmel*.

[3] A. DC. *Géogr. Bot.* 663. *Anethum segetum* L. or *Ridolfia segetum* (Mor. *Fl. Sard.* ii. 212, t. 75) is *Carum Ridolfia* B. H. According to these authors it is perhaps the common Parsley or one of its forms. In Persia and southern Europe it has nearly the same uses as the Caraway.

[4] Koch, *Umb.* 121.—DC. *Prodr.* iv. 115, n. 3.—Rosenth. *op. cit.* 532.—*Bunium Bulbocastanum* L. *Spec.* 349.—Lamk. *Ill.* t. 197.—*B. minus* Gouan. — *Scandix Bulbocastanum* Mœnch. — *Sium Balbocastanum* Spreng. (*Pignut, Earthnut, Jarnut, Yarnut, Kippernut*, &c.).

[5] *Bunium denudatum* DC. and *ferulæfolium* Desf. have also subterranean portions filled with juice, swollen like nuts and edible. *Cryptotænia canadensis* DC. which is a *Carum* (p. 121), is also said to have an edible subterranean portion.

[6] *Pimpinella Anisum* L. *Spec.* 399.—Hayne, *Arzn. Gew.* t. 22.—Nees, *Off. Pfl.* t. 17.—Lindl. *Fl. Med.* 38.—Guib. *loc. cit.* 223, fig. 623.—Berg et Schm. *Off. Gew.* t. 18 *d*.—Flück. et Hanb. *op. cit.* 276.—*Anisum vulgare* Clus. *Hist.* ii. 202.—*A. officinale* Mœnch.—*Sison Anisum* Spreng.—*Apium Anisum* Targ.

[7] *Pimpinella Panatjan* Miqb. ex Rosenth. *op. cit.* 533.

[8] *Pimpinella saxifraga* L. *Spec.* 378.—Hayn. *Arzn. Gew.* 7, t. 20.—Gren. et Godr. *Fl. de Fr.* i. 727.—*Tragoselinum saxifragum* Mœnch. *Meth.* 99.—*T. minus* Lamk.

[9] *Pimpinella magna* L. *Mantiss.* 217.—DC. *Prodr.* iv. 119.—Hayn. *loc. cit.* t. 21.—Gren. et Godr. *loc. cit.* i. 727. —*Tragoselinum magnum* Mœnch.—*T. majus* Lamk.

species, have acrid diuretic roots, formerly employed as masticatories, now nearly abandoned. The leaves were used to make detersive cataplasms. They have also served as fodder, and the young shoots are considered edible in Greece. *C. nigrum*,[1] *alpinum*,[2] and *dissectum*[3] have analogous properties. *C. Sisarum*,[4] a species renowned in the extreme East, formerly cultivated in our gardens for its edible root, but now much more rare, is considered tonic,[5] and is used for preparing a digestive alcoholic liquor.[6] The fruit of *Sison Amomum*[7] (fig. 122), now almost abandoned, was esteemed diuretic, carminative, stomachic. That of *C. Falcaria*,[8] now unused, had the same reputation, nearly so in the East that of *C. Ajowan*,[9] *copticum*,[10] and some others.[11] *C. Podagraria*[12] derived its name from its, perhaps imaginary, anti-gout properties. In the north of Europe it is mixed with vegetables to flavour them. The Fennels (fig. 114) are of various kinds, all endowed with analogous properties, and often mistaken one for another; but those employed in medicine and domestic economy appear to be all forms or varieties of one and the

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[1] *Pimpinella nigra* W. *Spec.* 1471 (var. with many authors, of *C. Saxifraga*).

[2] *Pimpinella alpina* Host. *Fl. Austr.* i. 399.

[3] *Pimpinella dissecta* Retz. *Obs.* 3, t. 2.—Nees, *Off. Pfl.* t. 19 (var. (?) of *C. magnum*).

[4] *Sium Sisarum* L. *Spec.* 361.—DC. *Prodr.* iv. 124, n. 1.—Rosenth. *op. cit.* 534 (*Skirret*).

[5] Ancient physicians considered it a specific for mercurial salivation, stomatitis, angina, &c.

[6] Many authors agree in considering as only a form of this plant the *Ninsin* of China and Japan (*Sium Ninsi* Burm. *Ind.* t. 29;—Thunb. *Fl. Jap.* 118), an aromatic and tonic plant to which are attributed all the properties of the Chinese *Ginseng*, and distinguished from it only by a "mass of tubercular roots, whence rise several geniculate and ramose stems" (Guib. *op. cit.* iii. 203).

[7] L. *Spec.* 362.—Jacq. *Hort. Vindob.* iii. t. 18.—DC. *Prodr.* iv. 110.—*Cicuta Amomum* Crantz.—*Sium Amomum* Roth.—*S. aromaticum* Lamk.—*Seseli Amomum* Scop. (*Rock Parsley*). Its fruit is often substituted for that of *Ammi copticum*, but is distinguished by the absence of small tubercles on its surface.

[8] *Sium Falcaria* L. *Spec.* 362.—Jacq. *Fl. Austr.* t. 257.—*Bunium Falcaria* Bieb.—*Seseli Falcaria* Crantz.—*Drepanophyllum agreste* Hoffm.—*Crithamus agrestis* Bess. *Enum. Volh.* 92.—*Falcaria Rivini* Host, *Fl. Austr.* i. 381.—DC. *Prodr.* iv. 110, n. 1.—Gren. et Godr. *Fl. de Fr.* i. 733.

[9] *Ligusticum Ajowan* Roxb. *Cat. Hort. Calc.* 21.—*L. Ajawain* Schult.—*Athamantha Ajowan* Wall.—*Ptychotis Ajowan* DC. *Mém. Soc. Gen.* iv. (ex *Prodr.* iv. 109, n. 5).—Rosenth. *op. cit.* 530.—Flück. et Hanb. *Pharmacogr.* 269 (*Bishop's weed*).

[10] *Ammi copticum* L. *Mant.* 56.—*Bunium copticum* Spreng.—*Trachyspermum copticum* Link.—*Ptychotis coptica* DC. *Prodr.* iv. 108, n. 3.—Rosenth. *op. cit.* 530.

[11] Particularly *Ptychotis Roxburghiana* DC. *sylvestris* Royl. and *involucrata* Royl. (Rosenth. *loc. cit.* 530).

[12] *Ægopodium Podagraria* L. *Spec.* 379.—DC. *Prodr.* iv. 114.—Rosenth. *op. cit.* 531.—*Podagraria Ægopodium* Lamk.—*Tragoselinum Angelica* Lamk.—*Pimpinella angelicæfolia* Lamk.—*Ligusticum Podagraria* Crantz.—*Seseli Ægopodium* Scop.

same species, *Fœniculum vulgare*,[1] which appears indigenous to all Western and Mediterranean Europe, and which, in ancient times, was cultivated and employed for its aromatic and stimulating properties. Its young shoots form an aliment, its leaves and fruit a condiment. From the latter are prepared a distilled water and an essential oil, and they also enter into several other medicinal preparations. The Chervil (fig. 153) is *Chærophyllum Cerefolium*,[2] believed to be a native of Southern Europe. It is now chiefly a condiment, with aromatic taste and smell. *C. sylvestre*[3] (fig. 151, 152) is a suspected, narcotic plant; its young shoots and roots, however, are sometimes eaten as potherbs. *C. temulum*,[4] common in our woods and hedges, is also considered poisonous. *C. bulbosum*,[5] now often cultivated, has fleshy roots with a sweet and aromatic flavour, and forms an agreeable aliment.[6] *Myrrhis*, so near *Chærophyllum* in organization, has nearly the same properties. *M. odorata*[7] (fig. 154, 155), known by the common name of Musk Chervil, sometimes forms an aliment and a condiment. The American *Osmorrhiza*[8] is a *Myrrhis*, and has its properties. The same may be said of *Scandix*, particularly *S. australis*[9] and *gilanica*.[10] *S. Pecten Veneris*[11] (fig. 156), remarkable for the long beak of its fruit, and so common

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[1] Gærtn. *Fruct.* i. 105.—DC. *Prodr.* iv. 142, n. 1.—Guib. *Drog. Simpl.* ed. 6, iii. 228.—Flück. et Hanb. *Pharmacogr.* 274.—*F. dulce* C. Bauh. *Pin.* 147.—*F. officinale* All. *Fl. pedem.* n. 1359.—*F. Panmorium* DC. *loc. cit.* n. 4.—*F. piperitum* DC. *loc. cit.* n. 3.—*Anethum Fœniculum* L. *Spec.* 722.—*A. Panmorium* Roxb. *Cat. Hort. Calc.* 22.—Hayn. *Arzn. Gew.* t. 18.—*Meum Fœniculum* Spreng.

[2] Crantz, *Fl. Austr.* 191.—*C. sativum* Lamk. *Dict.* i. 684.—*Scandix Cerefolium* L. *Spec.* 368.—*Anthriscus Cerefolium* Hoffm. *Umb.* 41, 47, t. 1, fig. 21.—DC. *Prodr.* iv. 223, n. 6.—Guib. *loc. cit.* 218.—*Cerefolium sativum* Bess. *Gal.* i. 218.

[3] L. *Spec.* 369.—*C. alpinum* Vill.—*C. magellense* Ten.—*Anthriscus sylvestris* Hoffm. *Umb.* 40, 46.

[4] L. *Spec.* 370.—DC. *Prodr.* iv. 226, n. 7.—Gren. et Godr. *Fl. de Fr.* i. 745.—*Myrrhis temula* Gærtn.—*Scandix temula* Roth.—*S. nutans* Mœnch.

[5] L. *Spec.* 370.—DC. *Prodr.* iv. 225, n. 6.—Gren. et Godr. *loc. cit.* 743.—*Myrrhis bulbosa* Spreng.—*Scandix bulbosa* Roth.

[6] *C. tuberosum* Royle, *Prescottii* DC. *hirsutum* L. have analogous properties.

[7] Scop. *Fl. carniol.* ii. n. 341.—DC. *Prodr.* iv. 231.—Rosenth. *op. cit.* 555.—*Scandix odorata* L. *Spec.* 368.—*Chærophyllum odoratum* Lamk. *Dict.* i. 683.

[8] Chiefly *O. Claytonii* (*Myrrhis Claytonii* Torr.).—*O. longistylis* DC.—*O. brevistylis* DC. *Prodr.* iv. 232.

[9] L. *Spec.* 369.—DC. *Prodr.* iv. 221.—Rosenth. *op. cit.* 553.—*Myrrhis australis* Hoffm.—*Chærophyllum australe* Crantz.

[10] Gmel. *It.* iii. 304, t. 31, fig. 2.—DC. *Prodr.* iii. 222, n. 9.

[11] L. *Spec.* 368.—DC. *Prodr.* iii. 221, n. 2.—Gren. et Godr. *Fl. de Fr.* i. 740.—*S. Pecten* Hoffm. *Umb.* i. 24, t. 1, fig. 22.—*Chærophyllum Pecten Veneris* Crantz.—*C. rostratum* Lamk. (part).—*Myrrhis Pecten Veneris* All. *Fl. Pedem.* n. 1376.

in our crops, has been accounted a cure for flux, amenorrhœa, wounds and vesicular affections. It is probably not much more active than *Smyrnium*, to which the ancients attributed so many virtues. *S. Olusatrum*[1] (fig. 142–144) has edible shoots, and supplies fodder for animals. Its fruit is accounted antiscorbutic. *S. perfoliatum*[2] was reputed aromatic and stimulant, as also *S. rotundifolium*.[3] *Molopospermum cicutarium*[4] (fig. 141) is said to be narcotic, and capable of producing serious accidents, gangrene, &c.

Apium consists also of aromatic plants. The most common is the Celery, believed to be a cultivated form of *A. graveolens*[5] (fig. 125), whilst the wild plant is the Ache, the root of which is employed in medicine, and whose fruit is aperitive, stimulant, carminative. The Celery is very odorous, exciting, antiscorbutic.[6] *A. nodiflorum*,[7] a species common in our ditches, is considered poisonous, probably in error, since it is eaten on the banks of the Rhine as watercress. It is diuretic, and said to be efficacious in chronic cutaneous affections; its root is the Water-parsnip of some provinces. *A. leptophyllum*,[8] a species common in America, has aromatic, carminative fruit, now little used.[9] The Skirret has analagous properties much like those of *Carum Sisarum*. The types of the genus are *Sium latifolium*[10] and *angustifolium*.[11] They are said to have a poisonous root. The leaves

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[1] L. *Spec.* 376.—Lamk. *Ill.* t. 204.—DC. *Prodr.* iv. 247, n. 1.—Rosenth. *op. cit.* 557.—*S. Math.* 773 T. *Inst.* 316.

[2] Mill. *Dict.* n. 3.—L. *Spec.* 376.—DC. *Prodr.* n. 2.—*S. Dioscoridis* Spreng. *Umb.* 25.

[3] Mill. *Dict.* n. 2.—DC. *Prodr.* n. 3.—*S. Dodonæi* Spreng.—*S. ramosum* d'Urv.—*S. ægyptiacum* L. *Amœn.* iv. 270. (Its fruit was formerly designated under the name of *Semina Smyrnii cretici*.)

[4] DC. *Prodr.* iv. 230.—*M. peloponesiacum* Koch.—*Athamantha Golaka* Hacq. (ex DC.).—*A. Galatta* Gmel.—*Ligusticum peloponesiacum* L. *Spec.* 360.

[5] L. *Spec.* 379.—Hayn. *Arzn. Gew.* vii. t. 24.—DC. *Prodr.* iv. 101, n. 1.—Guib. *op. cit.* iii. 207, fig. 613.—Rosenth. *op. cit.* 528.—*A. Celleri* Gærtn. *Fruct.* i. t. 22.—*Seseli graveolens* Scop. *Fl. Carn.* n. 360.—*Sium apium* Roth.

[6] The same properties are said to be observed, though in a less degree, in *A. antarcticum* Soland. *prostratum*, *peregrinum*, &c.

[7] *Sium nodiflorum* L. *Spec.* 361.—*Sison nodiflorum* Brot. *Fl. Lusit.* i. 423.—*Seseli nodiflorum* Scop.—*Helosciadium nodiflorum* Koch, *Umb.* 125.—Rosenth. *op. cit.* 529.

[8] *Pimpinella leptophylla* Pers. *Syn.* i. 324.—*—P. lateriflora* Link.—*P. domingensis* W.—*Helosciadium lateriflorum* Koch, *Umb.* 126.—*H. leptophyllum* DC. *Mém. Soc. Gen.* iv.; *Prodr.* iv. 105, n. 6.

[9] The plant employed by the Indians of Oregon and which Lindley named *Helosciadium californicum*, is a *Sium*.

[10] L. *Spec.* 361.—Jacq. *Fl. Austr.* t. 66.—Hayn. *Arzn. Gew.* i. t. 38.—DC. *Prodr.* iv. 124.—Rosenth. *op. cit.* 534.—*Coriandrum latifolium* Cr. *Fl. Austr.* 219.—*Drepanophyllum palustre* Hoffm. *Umb.* 110.

[11] L. *Spec.* 1672.—Jacq. *Fl. Austr.* t. 67.—Hayn. *Arzn. Gew.* i. t. 39.—DC. *Prodr.* n. 8.—*S. erectum* Huds.—*Berula angustifolia* Koch, *Deutschl. Fl.* ii. 455.

were reputed aperitive, diuretic, and antiscorbutic, as also their fruit, abandoned in our country. *S. californicum*,[1] a near neighbour of, if not identical with, *S. angustifolium*, has a root esteemed as an aliment and a condiment by the Indians of Oregon.[2] *Ammi* also comprises stimulant and more or less acrid plants. Their odour is generally feeble,[3] especially in *A. majus*,[4] a European species whose achenes are bitter, carminative and little used, and in *A. Visnaga*,[5] the fruit of which is diurectic, aperitive, and whose pedicels are used as tooth-picks[6] in Spain.

The decidedly poisonous plants are not very numerous in the Caraway series. They are *Cicuta*, that is the true Hemlocks, one species of which, *C. virosa*[7] (fig. 123, 124), is indigenous, growing in marshes and ponds. Its odour is disagreeable, and all its parts contain a yellowish juice of extreme acridity, dangerous alike to man and animals. The same properties are attributed to it as to *Conium*, but it is not used in medicine. The fruit contains an essential oil found also in Cumin, and its subterranean portions often consist of turnip-shaped tubercles which have caused serious accidents from being mistaken for edible roots. In North America there is another equally dangerous *Cicuta* (*C. maculata*[8]), also common in marshes. The same properties are attributed to it as to the Great Hemlock, but its action is much more energetic and its fresh tubercles are a violent poison, the effects of which have been compared to those of

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[1] *Helosciadium californicum* Hook. and Arn. ex A. Gray, *Pl. Wright.* ii. 65.

[2] In Cochinchina, *S. græcum* Lour. (ex Rosenth. *op. cit.* 534) has diuretic and carminative fruit, and its leaves are potherbs (*Rau Kân hoang* of the Annamites).

[3] The *Ammi* of commerce, very odorous, is *Ptychotis*. That said to be from Crete is *P. verticillata* DC. and that from India *P. Ajowan*, that is, a *Carum* (p. 179, note 9).

[4] L. *Spec.* 349.—Lamk. *Ill.* t. 193.—Sibth. *Fl. Græc.* t. 273.—DC. *Prodr.* iv. 113, n. 1.—*A. Bœberi* Hoffm.—*A. cicutæfolium* W. *A. glaucifolium* L. is often substituted for the preceding.

[5] Lamk. *Dict.* i. 132.—DC. *Prodr.* iv. 113, n. 4.—*Daucus Visnaga* L.—*Visnaga daucoides* Gærtn. *Fruct.* i. 92, t. 21.

[6] These two species should not be confounded with *A. copticum*, which is a *Carum* of the section *Ptychotis* and which gives one of the odorous *Ammi* of commerce.

[7] L. *Spec.* 368.—Œd. *Fl. Dan.* t. 208.—Nees, *Off. Pfl.* 12, t. 8.—Hayn. *Arzn. Gew.* i. t. 13.—Bull. *Herb.* t. 31.—Guib. *op. cit.* iii. 221, fig. 620.—Endl. *Enchirid.* 386.—Lindl. *Fl. Med.* 34.—Rosenth. *op. cit.* 527.—*Cicutaria aquatica* Lamk. *Dict.* ii. 2.—*Coriandrum Cicuta* Roth.—*Sium Cicuta* Vest.

[8] L. *Spec.* 367.—Bigel. *Fl. Bost.* ed. 2, 115; *Amer. Med. Bot.* i. t. 12.—Torr. *Fl. Unit. St.* i. 308.—Rafin. *Med. Bot.* i. t. 12.—Lindl. *Fl. Med.* 34.—A. Gray, *Man.* ed. 5, 196.—Chapm. *Fl. S. Unit. St.* 161.—*Cicutaria maculata* Lamk. *C. tenuifolia* Froel. and *angustifolia* Kit. which probably are not distinct species, have the same properties.

cyanhydric acid. In our country several species of *Conium*, *Æthusa*, and *Œnanthe* have been confused under the name of Hemlock with the preceding. *Conium maculatum*[1] (fig. 145–148) is the Great Hemlock. It is a dicarpous plant, growing among rubbish, in neglected gardens, and near buildings, and owes its specific name to the purplish irregular spots which mark the lower part of the stem. Its odour is strong and nauseous. The stems, leaves, and especially the fruit, contain an alkaloid, *Conia*,[2] to which it owes its poisonous properties. From this plant, at least in great part, was derived the beverage administered by the Athenians to persons condemned to death.[3] It is almost the only hemlock employed medicinally, chiefly externally, in cutaneous affections, glandular swellings, and even cancer. The Lesser Hemlock is *Æthusa Cynapium*[4] (fig. 105–108), an annual, slightly glaucescent, the lower part of the stem often marked with purple, generally slender, vertical lines, common in some gardens and cultivated fields, among rubbish. It is very poisonous, and causes many accidents from its being mistaken for Parsley or Chervil, from which its strong odour should suffice to distinguish it; it is no longer employed in medicine.[5] Many plants of the genus *Œnanthe* are regarded as Water Hemlocks. The most common in our country is Water Dropwort[6] (fig. 104), a perennial

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[1] L. *Spec.* 349. — Endl. *Enchirid.* 386. — Lindl. *Fl. Med.* 57; *Veg. Kingd.* 777. — Schkuhr, *Handb.* t. 62.—Bull. *Herb.* t. 63.—Hayne, *Arzn. Gew.* i. t. 31.—Sow. *Engl. Bot.* t. 1191.—Mér. et Del. *Dict. Mat. Méd.* ii. 385. Guib. *op. cit.* iii. 219, fig. 619.—DC. *Prodr.* iv. 242, n. 1.—Nees, *Pl. Med.* t. 282.—Turp. *Dict. Sc. Nat.* Atl. t. 110.—Pereira, *Med. Gaz.* xix. 763.—Gren. et Godr. *Fl. de Fr.* i. 750.—Berg et Schm. *Off. Gew.* t. 24 *e*.—Caz. *Pl. Méd. Indig.* (ed. 3) 304.— Flück. et Hanb. *Pharmacogr.* 266.—*Cicuta major* Lamk. *Dict.* ii. 3.—*C. maculata* Lamk. *Fl. Fr.* iii. 104.—*Coriandrum maculatum* Roth, *Fl. Germ.* i. 130.

[2] *Cicutine*, *conine*, *coniine* or *conéine* ($C^8H^{15}Az$). Extracted by Giesecke from the Great Hemlock in 1827; it is accompanied by *conhydrine* and *methylconicine*. Its properties are analogous to those of *conium*. (See Casaubon, *Et. Phys. de la Conicine, Thès. Fac. Méd. Par.* [1868] n. 138).

[3] It is what Socrates drank. But "it is presumed that the beverage administered to the condemned at Athens contained, besides the juice of the Hemlock, opium, whose properties accord better with the symptoms of the death of Socrates as described by the best historians" (Guib.).

[4] L. *Spec.* 367.—Lamk. *Dict.* i. 47; *Ill.* t. 196.—Hayn. *Arzn. Gew.* i. t. 35.—Sow. *Engl. Bot.* t. 1192.—Bull. *Herb.* t. 91.—Curt. *Fl. Lond.* t. 18.—Mér. et Del. *Dict. Mat. Méd.* i. 92.—DC. *Prodr.* iv. 141, n. 1.—Lindl. *Fl. Med.* 40.— Guib. *loc. cit.* 221, fig. 621.— Gren. et Godr. *Fl. de Fr.* i. 712.—Caz. *Pl. Méd. Indig.* (ed. 3) 317.—Rosenth. *op. cit.* 536.—H. Bn. *Dict. Encycl. Sc. Méd.* ii. 51.—*Coriandrum Cynapium* Cr. *Fl. Austr.* 211.—*Cicuta Cynapium* Targ.

[5] The same properties are attributed to *Æ. cynapioides* Bieb and *segetalis* Bœnn.

[6] *Œnanthe Phellandrium* Lamk. *Fl. Franç.* iii. 432.—DC. *Prodr.* iv. 138, n. 12.—Guib. *loc. cit.* iii. 235, fig. 628.—Gren. et Godr. *Fl. de Fr.* i. 716.—Nees et Eberm. *Pl. Off.* t. 287.—Lindl. *Fl. Med.* 40.—Rosenth. *op. cit.* 535.—Caz. *op. cit.* 825.—Berg et Schm. *Off. Gew.* t. 25 *d*.—Œ.

herb with a rhizome plunging into the mud, having at each of its nodes a bundle of adventitious roots. Its fruit has been prescribed against asthma and pulmonary consumption. It has also been considered diuretic and antidiarrhœtic; but it must never be forgotten that it is a poisonous plant and sometimes causes the death of animals. Meadow Saffron (fig. 103) owes its name to the colour of its juice, a virulent poison, producing intestinal inflammation speedily followed by delirium, convulsions and death. It is the more dangerous as its root [1] has a sweet and aromatic taste in eating which no suspicion is excited of the deleterious character of the plant. *Œ. fistulosa* [2] is nearly as poisonous. It was formerly employed against gravel, hemorrhoids, scrofula, and to destroy moles and rats. Several other European species have similar properties, particularly *Œ. Lachenalii*,[3] *apiifolia*,[4] *peucedanifolia*,[5] *incrassans*.[6] On the other hand *Œ. pimpinelloides* [7] has edible tubercles whose qualities are nearly those of the Parsnip. From *Œ. inebrians*, of the Cape, now named *Anesorhiza gummifera*,[8] the Hottentots prepare a fermented beverage.

Thapsia also comprises Umbellifers of great acridity. The best known medicinally is *T. garganica* [9] (fig. 75, 76), a beautiful species from the Mediterranean region, of which the Greek and Roman physicians are thought to have made great use and whose root is gorged with an irritant, drastic, emmenagogic juice. The Arabs obtain an energetic blistering by applying to the skin the inner surface of the bark of this root. It is a plant which may produce

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aquatica Lamk. *Dict.* iv. 530.— *Phellandrium aquaticum* L. *Spec.* 366.—Hayn. *Arzn. Gew.* i. t. 40.—*Ligusticum Phellandrium* Cr. (*Water Hemlock.*)

[1] *Œ. crocata* L. *Spec.* 365.—Jacq. *Hort. Vindob.* iii. t. 55.—Smith, *Engl. Bot.* t. 2313.—Bull. *Herb.* t. 113.—DC. *Prodr.* iv. 138, n. 8.—Gren. et Godr. *Fl. de Fr.* i. 713.—Guib. *loc. cit.* 236.—Lindl. *Fl. Med.* 39.—Rosenth. *op. cit.* 535.—Caz. *loc. cit.* 695.—*Œ. lusitanica* Brot. *Fl. Lus.* i. 420; *Phyt. Tab.* 33.

[2] L. *Spec* 365.—Drev. et Heyn. *Pl. Cur.* t. 98.—DC *Prodr.* n. 1.—Gren. et Godr. *Fl. de Fr.* i. 715.—Guib. *loc. cit.* 235.—Rosenth. *op. cit.* 536.

[3] Gmel. *Fl. Bad.* i. 678.

[4] Brot. *Fl. Lusit.* i. 420; *Phyt.* t. 33.

[5] Poll. *Pal.* i. 289, fig. 3.

[6] Bory, ex Rosenth. *op. cit.* 536.

[7] L. *Spec.* 365.—DC. *Prodr.* n. 5.

[8] *Bubon gummiferum* L. *Comm. Hort. Amst.* t. 58.—*Glia gummifera* Sond. *Fl. Cap.* ii. 548.—*Lichtensteinia pyrethrifolia* DC.— *L. inebrians* E. Mey.—*Lepisma paniculatum* E. Mey (part).

[9] L. *Mantiss.* 57.—Gouan, *Ill. et Obs. Bot.* 18, t. 10.—Desf. *Fl. Atl.* i. 262.—Sibth. *Fl. Græc.* t. 287.—Ait. *Hort. Kew.* (ed. 2) i. 156.—DC. *Prodr.* iv. 202, n. 1.—Hook. f. *Bot. Mag.* t. 6293.—Boiss. *Fl. Or.* ii. 1067.—Guib. *loc. cit.* 216.—*T. decussata* Lagasc. *Gen. et Sp.* 12.

serious accidents.[1] *T. Asclepium*,[2] a Levant species, doubtless also acts as an irritant and substitutive when employed, as it was by the ancients, to reduce and modify obstinate ulcers. *T. villosa*[3] has the same properties as the two preceding species; the Moors use its root as a drastic.[4] From all these species gum-resins can be extracted which operate like the plant itself. What are called in therapeutics the *five gum-resins* of the Umbellifers are furnished chiefly by the Ferulas. The first, *Asafœtida*,[5] notorious for its repulsive odour and antispasmodic properties, was formerly extracted in Persia from the root of *Peucedanum Asafœtida*[6] (fig. 87). That imported from India by England is from *P. Narthex*,[7] and it is thought that a certain quantity of this drug may be furnished in Persia by *P. alliacea*,[8] in Songaria by *F. teterrima*[9] and by other species. *Galbanum*,[10] accounted stimulant and expectorant and entering into the composition of certain healing and adhesive plasters, was formerly attributed to plants of the genera *Galbanum*[11] and *Opoidia*;[12] it is now believed to be produced in Persia and neighbouring countries from *P. galbaniflum*[13]

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[1] The utmost precaution should be taken against those who sell this plant under the name of *Silphium cyrenaicum*. Either their preparations contain only an inert extract, of variable origin, or they contain the true resin of *Thapsia garganica* which is extremely irritant. Viviani (*Fl. Lyb.* 17) believed that the *Silphium cyrenaicum* of the ancients, about which there has been so much discussion, was a *Thapsia*, and De Candolle, following the opinion of Gussone, made it a var. γ of *T. garganica*. Others think that there was, in Cyrenaica, a valuable plant similar to that which gives the *Asafœtida*, especially in habit, inflorescence and probably also in properties, but which has now disappeared from that country.

[2] L. *Spec.* 375.—Sibth. *Fl. Græc.* t. 286.—Guss. *Prodr. Fl. Sic.* i. 370.—DC. *Prodr.* n. 3.—Rosenth. *op. cit.* 550.

[3] L. *Spec.* 375.—Lamk. *Ill.* t. 206.—DC. *Fl. Franç.* iv. 342; *Prodr.* n. 2.—Gren. et Godr. *Fl. de Fr.* i. 679.—Rosenth. *op. cit.* 550.

[4] Cited as having the same properties are *T. maxima* Mill. and *fœtida* L. from southern Europe. The root of *Ourivali*, employed in Portugal as an antidiarrhœtic, has been attributed to a *Thapsia* (Rosenth. *op. cit.* 551).

[5] Guib. *loc. cit.* 239.—Pereira, *Elem. Mat. Med.* ed. 4, ii. p. ii. 175.—H. Bn. *Dict. Encycl. Sc. Méd.* vi. 409.—Flück. et Hanb. *Pharmacogr.* 280.

[6] *Ferula Asa-fœtida* L. *Mat. Med.* 79.—DC. *Prodr.* iv. 173, n. 18.—Borscz. *Pharmac. Ferul.* t. 1, 2.—Boiss. *Fl. Or.* ii. 994.—H. Bn. *Dict. Encycl. Sc. Méd.* ser. 4, i. 730.—*Asa-fœtida disgunensis* Kæmpf. *Amœn. Exot.* 335, tab.—*Scorodosma fœtidum* Bge. *Pl. Lehm.* 309 (*Sassyk-Kurai* or *Karai* of the Kirghiz, *Kawar* of the Bokhares).

[7] Boiss. *Fl. Or.* ii. 994.—*Narthex Assafœtida* Falc. *Trans. Linn. Soc.* xx. 285; *Bot. Mag.* t. 5168.—H. Bn. *Dict. Encycl. Sc. Méd.* ser. 4, i. 731.—*Ferula Asa fœtida* B. H. *Gen.* 918 (not L.) (*Sip, Sup, Anjoodan*).

[8] *Ferula alliacea* Boiss. *Fl. Or.* ii. 995.—*F. Assa-fœtida* Boiss. et Buhse, *Aufz.* 100 (not L.), (*Angusch, Yandebuy*).

[9] Kar. et Kir. *Enum. Pl. in Song. Or.* 94, n. 177.—Flück. et Hanb. *Pharmacogr.* 281.—H. Bn. *Dict. Encycl. Sc. Méd.* ser. 4, i. 737.

[10] Guib. *loc. cit.* 248.—Flück. et Hanb. *Pharmacogr.* 285.

[11] Don, *Trans. Linn. Soc.* xvi. 603 (see p. 171, note 12, 3°).

[12] Lindl. *Bot. Reg.* (1839) Misc. 66 (see p. 171, note 12, 4°).

[13] *Ferula galbaniflua* Boiss. et Buhse, *Aufz.* 99.—Boiss. *Fl. Or.* ii. 988.—H. Bn. *Dict. Encycl.*

and *rubricaule*.[1] *P. Shair*[2] yields, between the Caspian and the Aral, a gum-resinous juice analogous to the *galbanum* of commerce. *Sagapenum*[3] has been attributed, without sufficient reason, to *P. persicum*[4] and to *P. Szowitzianum*;[5] it is difficult to obtain it pure in commerce, and it is unknown from what plant this gum-resin, so similar to gum-ammoniac,[6] is derived. The latter, used chiefly in the preparation of adhesive plasters, but administered also internally as an expectorant and tonic, comes from the section *Dorema* of *Peucedanum*, particularly from *P. Ammoniacum*[7] (fig. 88). *P. Aucheri*[8] yields a very good quality, rare in commerce. *Opopanax*,[9] another odorous gum-resin, now rare and dear, has been attributed to a European plant common in the region of the Mediterranean, *Opopanax Chironium*,[10] which, with us, belongs to a section of the genus *Malabaila*;[11] but there is no documentary evidence of this origin. *Peucedanum Hooshe*[12] has also been said, but with no better proof, to furnish *Opopanax*. *Sumbul*,[13] a fœtid drug prescribed against cholera and substituted for musk in the treatment of ataxic and adynamic affections, is extracted, in Turkestan, from *Peucedanum* (*Euryangium*) *Sumbul*.[14] *P. Ferula*,[15] a French species common in

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Sc. Méd. ser. 4, i. 735.—*F. erubescens* Boiss. *Ann. Sc. Nat.* ser. 3, i. 316 (part) (*Boridscheh, Kassnih*).

[1] *Ferula rubricaulis* Boiss. *Diagn. Or.* ser. 2, ii. 92; *Fl. Or.* ii. 995.—*F. erubescens* Boiss. (part).

[2] *Ferula Shair* Borscz. *Pharm. Ferul.* t. 6–8.—H. Bn. *Dict. Encycl. Sc. Méd.* ser. 4, i. 737 (*Schair* of the natives).

[3] Or *Serapinum*. Guib. *loc. cit.* 244.—Flück. et Hanb. *Pharmacogr.* 291.—J. R. *Dict. Encycl. Sc. Méd.* ser. 3, vi. 108.

[4] *Ferula persica* W. *Spec.* i. 1413.—DC. *Prodr.* iv. 173, n. 13.—Boiss. *Fl. Or.* ii. 992.—*F. Assa-fœtida* Mart. (not L.).—*F. puberula* Boiss. et Buhse, *Aufz.* 98.—*Assa fœtida* Hope, *Phil. Trans.* (1785) 36, t. 3, 4.

[5] *Ferula Szowitziana* DC. *Prodr.* n. 19.—Boiss. *Fl. Or.* ii. 994.

[6] Guib. *op. cit.* 244.—Flück. et Hanb. *Pharmacogr.* 288.

[7] *Dorema Ammoniacum* Don, *Trans. Linn. Soc.* xvi. 601.—Bge. *Mém. Acad. Pétersb.* (1850) vii. 308.—Borscz. *Pharm. Ferul.* t. 3–5.—Boiss. *Fl. Or.* ii. 1008.—Berg et Schm. *Off. Gew.* t. 26 *e*.—*Diserneston gummiferum* Jaub. et Spach, *Ill. Pl. Or.* i. 78, t. 40.—*D. hirsutum* Lopt. *Borscz. Pharm. Ferul.* 28 (ex Boiss.).

[8] *Dorema Aucheri* Boiss. *Ann. Sc. Nat.* ser. 3, i. 329; *Fl. Or.* ii. 1009.—*D. robustum* Lopt. (*Zuh, Billesur, Uschek*).

[9] Guib. *loc. cit.* 250.—Flück. et Hanb. *Pharmacogr.* 291.

[10] Koch, *Umb.* 96.—Nees, *Off. Pfl.* 17, t. 11.—DC. *Prodr.* iv. 171.—Gren. et Godr. *Fl. de Fr.* i. 698.

[11] *M. Opopanax*.—*Pastinaca Opopanax* L. *Spec.* 376.—Sibth. *Fl. Græc.* t. 288.—*Ferula Opopanax* Cr. *Fl. Austr.* 53.—Spreng. *Umb.* 77.

[12] *Ferula Hooshe* Lindl. ex Rosenth. *op. cit.* 543.

[13] Flück. et Hanb. *Pharmacogr.* 278.

[14] *Euryangium Sumbul* Kauffm. *Nouv. Mém. Soc. Nat. Mosc.* xii. (1871) t. 24, 25.—*Ferula Sumbul* Hook. f. *Bot. Mag.* t. 6196.—H. Bn. *Dict. Encycl. Sc. Nat.* ser. 4, i. 734.

[15] *Ferula communis* L. *Spec.* 355 (part).—H. Bn. *Dict. Encycl. Sc. Nat.* ser. 4, i. 736.—*F. nodiflora* Sibth. et Sm. *Fl. Græc.* iii. 72, t. 279.—*F. nodiflora* Vis.—*F. glauca* DC.—*F. nodiflora* L.—Gren. et Godr. *Fl. de Fr.* i. 69.

the Levant and Mediterranean region, in the Azores and Canaries, causes serious accidents to the unfortunates who, in a time of scarcity, think they can use its foliaceous ribs as food. With the ancients it was an antihysteric and antihemorrhagic plant. The hollow stems [1] were used to make cases for manuscripts and ferules or rods for schools (whence its generic name *Ferula*). In Podolia *P. sylvaticum* [2] is used in the treatment of gout, scrofula and intermittent fevers.[3] At Sarepta, the aromatic roots of *P.* (*Eriosynaphe*) *longifolium* [4] are eaten. *P. officinale*,[5] a south-European species, was esteemed for its aperitive, expectorant, diuretic root, but is no longer employed. *P. Oreoselinum* [6] (fig. 81, 82) is reputed diaphoretic, stimulant; its fruit was considered a febrifuge. *P. Cervaria* [7] was prescribed as a diuretic and febrifuge; *P. italicum* and *parisiense*, as stimulants and tonics; *P. montanum* as bitter, tonic, its root was said to cure epilepsy. *P. sylvestre* [8] was used as a masticatory and replaced Ginger; its root has been administered as a certain cure for epilepsy. *P. alsaticum* [9] had the same uses as *P. Cervaria*. In North America, *P. ambiguum* [10] and *rigidius* [11] are cited as stimulants and tonics. *P. Galbanum* [12] (fig. 89), a remarkable species from the Cape of Good Hope, derives its specific name from the opinion, long

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[1] They contain, however, a little spongy medullary substance of which a sort of tinder is made.

[2] *Ferula sylvatica* Bess. *Enum. Pl. Volh. et Podol.* 44.—DC. *Prodr.* iv. 171, n. 1.—Rosenth. *op. cit.* 744.—*F. nodiflora* Rochel.—*Ferulago sylvatica* Reichb. *Ic.* iv. t. 371.

[3] *P. orientale* Boiss. (*Ferula orientalis* L.) has been considered as producing the gum ammoniac. *P. geniculatum* (*Ferula geniculata* Guss.) was a medicinal plant in Greece. *P. tingitanum* (*Ferula tingitana* L.) was reputed to furnish an African gum ammoniac and *Silphion*. *P. Ferulago* (*Ferula Ferulago* L.) had been named by Koch *F. galbanifera*, but it does not produce *galbanum*. *P. ovinum* H. Bn. (*Ferula ovina* Boiss.), or *Kuma* of the Persans, is aromatic and liked by sheep. *P. cinereum* (*Ferulago cinerea* Boiss.) is eaten in the East as a condiment with boiled rice.

[4] *Ferula longifolia* Fisch. *Cat. Hort. Gorenk.* (1812) 46.—*Eriosynaphe longifolia* DC. *Mém.* 50, t. 1, E; *Prodr.* iv. 175.

[5] L. *Spec.* 353.—DC. *Fl. Fr.* iv. 336; *Prodr.* iv. 177, n. 2.—*Selinum Peucedanum* Sow. *Engl. Bot.* t. 1767.

[6] Cuss. ex Lapeyr. *Abr. Pyr.* 149.—DC. *Prodr.* n. 21.—*Oreoselinum nigrum* Delarbr.—*Selinum Oreoselinum* Scop.

[7] Cuss. ex Lapeyr. *Abr. Pyr.* 149.—Koch, *Umb.* 94.—DC. *Prodr.* n. 20.—Gren. et Godr. *Fl. de Fr.* i. 688.—*Selinum Cervaria* Scop.—*Athamantha Cervaria* L.

[8] DC. *Prodr.* iv. 179, n. 17.—*P. palustre* Mœnch.—*Thysselinum palustre* Hoffm.—*Selinum sylvestre* L. *Hort. Upsal.* 59.

[9] L. *Spec.* 354 (not Poir.).—DC. *Prodr.* n. 19.—*Daucus alsaticus* Bauh.—*Cnidium alsaticum* Spreng.

[10] *Œnanthe ambigua* Nutt. *Gen. Amer.* i. 189.—*Pastinaca ambigua* Torr.—*Archemora ambigua* DC. *Prodr.* iv. 188, n. 1.

[11] *Sium rigidius* L. *Spec.* 362.—*Œnanthe rigida* Nutt.—*Sion marginatum* Michx.—*Pastinaca rigida* Spreng.—*Archemora rigida* DC. *Prodr.* n. 2. According to Barton, it is an extremely violent poison.

[12] B. H. *Gen.* 920.—*Bubon Galbanum* L. *Spec.* 364.—Jacq. *Hort. Vindob.* iii. t. 36.—Harv. and Sond. *Fl. Cap.* ii. 560.—Rosenth. *op. cit.* 546.—*Agasyllis Galbanum* Spreng.

credited, that its very aromatic juice constituted *galbanum;* it is a highly stimulant plant. We have seen that Imperatoria, Anise and Parsnip belong to the genus *Peucedanum*. *P. Pastinaca* [1] (fig. 83, 84) is especially now a vegetable; its edible root is used in Germany to prepare a syrup and preserves. Its fruit is tonic, carminative; it was formerly cited as an emmenagogue, as also an essence distilled from it and still used in perfumery. Anise is *P. graveolens* [2] (fig. 85) a powerful digestive and carminative; its odour is so strong that its essence is used to mask the taste of certain disagreeable medicines. Gladiators used to consider its fruit strengthening; it is a condiment in some countries. It might be a powerful stimulant. Imperatoria (*Peucedanum Ostruthium* [3]) is much less active. Its root is considered tonic; it was used as a detergent for ulcers, and veterinary surgeons sometimes gave it to small cattle as a preservative against certain epizoa. Cumin [4] (fig. 70, 71) is nearly as aromatic as Anise. Its perfume is however quite peculiar. It is probably a plant of eastern origin, but is scarcely ever found except as cultivated in the Mediterranean region, Arabia, India, China, and even the United States. It is a condiment used in making some kinds of bread, cakes, liquors,[5] &c. The essential oil extracted from the fruit is employed in perfumery; it is said to be carminative and useful in removing glandular obstructions.[6] The Angelicas are also very aromatic Umbellifers.

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[1] *Pastinaca sativa* L. *Spec.* 376.—Hayn. *Arzn. Gew.* vii. t. 16.—DC. *Fl. Fr.* iv. 341; *Prodr.* iv. 188, n. 1.—Guib. *loc. cit.* 206.—Gren. et Godr. *Fl. de Fr.* i. 693.—*Anethum Pastinaca* Wib.—*Selinum Pastinaca* Cr. *P. Sekakul* Russ. is considered aphrodisiac in Egypt and Arabia.

[2] B. H. *Gen.* 919.—*Anethum graveolens* L. *Spec.* 377.—DC. *Prodr.* iv. 186.—Guib. *loc. cit.* 228, fig. 626.—Flück. et Hanb. *Pharmacogr.* 291.—*A. minus* Gouan.—*Pastinaca Anethum* Spreng. *Sch. Syst.* vi. 587.

[3] Koch, *Umb.* 95.—Nees, *Off. Pfl.* 12, t. 7.—*Imperatoria Ostruthium* L. *Spec.* 372.—Lamk. *Ill.* t. 199.—Hayn. *Arzn. Gew.* vii. t. 15.—Sow. *Engl. Bot.* t. 1380.—DC. *Prodr.* iv. 183.—Guib. *loc. cit.* 213, fig. 617.—Rosenth. *op. cit.* 546.—*Selinum Imperatoria* Cr. *Fl. Austr.* 174.

[4] *Cuminum Cyminum* L. *Spec.* 365.—Schkuhr, *Handb.* t. 80.—Woodw. *Med. Bot.* t. 190.—Nees, *Off. Pfl.* xiii. t. 7.—Hayn. *Arzn. Gew.* vii. t. 11.—Mér. et Del. *Dict. Mat. Méd.* ii. 516.—Guib. *loc. cit.* 227, fig. 625.—DC. *Prodr.* iv. 201, n. 2.—Lindl. *Fl. Med.* 51.—Caz. *Pl. Méd. Indig.* (ed. 3) 358.—Flück. et Hanb. *Pharmacogr.* 295.—*Fœniculum orientale Cuminum dictum* T. *Inst.* 312.

[5] It has been said to form no part of that called *Kümmel* and which is made only from Caraway. It is probable that the German name of the latter has caused this confusion; for *Kümmel* generally has the perfume of Cumin. The latter forms a constituent of Curries and other seasonings. It is a common opinion in Dauphiné that Cumin and other *Umbelliferæ* cause a return of milk to goats; whence the idea of giving it to nurses in whom this secretion has become suspended.

[6] *C. hispanicum* Mér. and *minutum* D'Urv. are cited as having the same qualities and are not perhaps distinct species.

First the garden or Bohemian Angelica[1] (fig. 99), whose stems are frequently preserved with sugar and employed in making certain liquors. Its root is odorous, sudorific, diuretic, stimulant, and renders great service as a digestive and stomachic. In America *A. Atropurpurea*[2] serves nearly the same purposes. *A. sylvestris*,[3] *Gmelini*, *decurrens*, *montana*, *lucida*, *littoralis*, *nemorosa*[4] and others have the same properties, but in less degree. *A. Levisticum*,[5] a plant of middle Europe, has leaves of a tolerably agreeable odour which are eaten when young. The mountaineers feed their cattle with them to cure lung diseases. The root and the leaves were formerly administered as stimulants and tonics.

The Corianders are also aromatic plants; but the perfume is mingled with a disagreeable odour like that of bugs (whence the generic name). The cultivated Coriander[6] (fig. 134–138) is however used in some countries to aromatize bread, cake, beer and cider. With several southern nations the fruit is a masticatory; it is carminative and stimulant, and as such is useful in veterinary medicine. *C. testiculatum*[7] (fig. 139) has the same properties,[8] though less used. *Lagoecia cuminoides*[9] (fig. 180–184), very odorous, has the same uses

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[1] *Angelica Archangelica* L. *Spec.* 360.—Œd. *Fl. Dan.* t. 206.—Hayn. *Arzn. Gew.* vii. t. 8.—Nees, *Off. Pfl.* ix. t. 14.—Sow. *Engl. Bot.* t. 2561.—*A. officinalis* Mœnch. *Meth.* 81.—*A. sativa* Mill. *Dict.* n. 1.—*Archangelica officinalis* Hoffm. *Umb.* i. 166.—Koch, *Umb.* 98, fig. 17, 19.—DC. *Prodr.* iv. 169, n. 1.—Guib. *loc. cit.* 210, fig. 615, 616.—Nees et Eberm. *Pl. Med.* 279. 280.—Lindl. *Fl. Med.* 43.—Pereira, *Mat. Med.* (ed. 4) ii. p. ii. 170.—Berg et Schm. *Off. Gew.* t. 27 *e*.—H. Bn. *Dict. Encycl. Sc. Méd.* vi. 22.

[2] L. *Spec.* 360.—DC. *Prodr.* iv. 168, n. 6.—*A. triquinata* Bigel. *Fl. Bost.* 68.—*Archangelica atropurpurea* Hoffm. *Umb.* 169.—Rosenth. *op. cit.* 542.

[3] L. *Spec.* 361.—Hayn. *Arzn. Gew.* vii. t. 9.—Sow. *Engl. Bot.* t. 1128.—DC. *Prodr.* iv. 168, n. 3.—Gren. et Godr. *Fl. de Fr.* i. 684.—H. Bn. *Dict. Encycl. Sc. Méd.* iv. 688.—*Imperatoria sylvestris* DC. *Fl. Fr.* iv. 286.—*Selinum Angelica* Roth.—*S. pubescens* Mœnch.—*S. sylvestre* Cr.

[4] Wormsk. ex DC. *Prodr.* iv. 170, n. 3.—Rosenth. *op. cit.* 241.—*Archangelica Gmelini* DC. *loc. cit.*

[5] All. *Fl. Pedem.* n. 1309.—*Ligusticum Levisticum* L. *Spec.* 359.—Hayn. *Arzn. Gew.* vii. t. 6.—*Angelica paludapifolia* Lamk. *Dict.* i. 173.—*Levisticum officinale* Koch, *Umb.* 101, fig. 41.—DC. *Prodr.* iv. 165.—Guib. *loc. cit.* 209.—Berg et Schm. *Off. Gew.* t. 25 *e*.

[6] *Coriandrum sativum* L. *Spec.* 367.—Blackw. *Herb.* t. 176.—Sow. *Engl. Bot.* t. 67.—Hayn. *Arzn. Gew.* vii. t. 13.—Sibth. *Fl. Græc.* t. 283.—DC. *Prodr.* iv. 250.—Mér. et Del. *Dict Mat. Méd.* ii. 430.—Guib. *loc. cit.* 238, fig. 629.—Nees et Eberm. *Off. Pfl.* t. 286.—Lindl. *Fl. Med.* 58.—Caz. *Pl. Méd. Indig.* (ed. 3) 350.—Berg et Schm. *Off. Gew.* t. 13 *e*.—Rosenth. *op. cit.* 558.

[7] L. *Spec.* 367.—DC. *Fl. Fr.* iv. 293.—*Anidrum testiculatum* Neck. *Elem.* n. 319.—*Bifora testiculata* Spreng. *Sob. Syst.* vi. 38, 448.—*B. dicocca* Hoffm. *Umb.* 192 (*Petite Coriandre*).

[8] *C. sativum* Lour. (*Fl. Cochinch.* [ed. 1790] 180), thought to be different (?) from *C. sativum* L. and which has been named *C. Loureirii* Kostel. is hypnotic, carminative; it is also useful for culinary purposes.

[9] L. *Spec.* 294.—Sibth. *Fl. Græc.* t. 243.—Lamk. *Ill.* t. 142.—DC. *Prodr.* iv. 233.—Rosenth. *op. cit.* 555.—H. Bn. *Bull. Soc. Linn. Par.* 135.—*Cuminoides* T.

as Cumin. *Laserpitium* is less aromatic but generally more bitter. The "white Gentian root" is that of *L. asperum*,[1] a plant from the dry woods and hills of Europe, formerly used as a tonic, emmenagogue and diuretic. This root is said to be purgative. *L. Siler*,[2] from southern Europe, is a vulnerary plant, rich in essential oil, extolled as a remedy for affections of the urinary organs, but now disused. *L. Archangelica*,[3] an aromatic species from the Carpathians and Carniola, yields a kind of stimulant and pectoral *Opopanax*. Its fruit serves as a condiment. *L. gummiferum*,[4] from the Mediterranean region, has been considered identical with *Silphium cyrenaicum* of the ancients. The root of *L. glabrum*[5] is said to be purgative, like that of *L. asperum*, of which *L. pruthenicum*[6] and *gallicum*[7] has also the properties. *Physospermum aquilegifolium*[8] (fig. 140) has the qualities of Angelica; its stems are eaten in some parts of Russia. The Cow-Parsnips (*Heracleum*) have properties very similar to those of the Angelicas, but are in general less aromatic. Among us *H. Sphondylium*[9] (fig. 91–94) often bears the name of wild Angelica. The young shoots are eaten in Siberia, where a sweet and succulent substance is extracted from the interior of the stem. *Parst* is a fermented beverage prepared by the poor in Poland from its leaves and fruit. In rural districts its crushed roots are believed to soften corns and callosities of the skin. *H. sibiricum*[10] has the same uses. In Sicily, *H. cordatum*[11] is employed as Angelica among us. *H. lanatum*,[12] an American species, has had a great reputation in the

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[1] Crantz, *Fl. Austr.* iii. 54.—DC. *Prodr.* iv. 204, n. 1.—*L. latifolium* Lamk. *Dict.* iii. 423.—Rosenth. *op. cit.* 551.—*L. Libanotis* Spreng.—*L. pubescens* Lagasc.

[2] L. *Spec.* 357.—Jacq. *Fl. Austr.* t. 145.—Hayn. *Arzn. Gew.* vii. t. 7.

[3] Jacq. *Ic. Rar.* i. t. 58; *Collect.* i. 214.—DC. *Prodr.* n. 14.—Rosenth. *op. cit.* 551.—*L. Chironium* Scop. *Fl. Carniol.* n. 324.

[4] Desf. *Fl. Atl.* i. 254, t. 72.—*L. thapsiæforme* Brot.—*Thapsia gummifera* Spreng.

[5] Crantz, *Fl. Austr.* iii. 54.—DC. *Prodr.* n. 2.—*L. latifolium* Jacq. *Fl. Austr.* t. 146.

[6] L. *Spec.* 357.—Jacq. *Fl. Austr.* t. 153.—DC. *Prodr.* n. 16.

[7] C. Bauh. *Pin.* 156.—L. *Spec.* 357.—DC. *Prodr.* n. 8.—Gren. et Godr. *Fl. de Fr.* i. 681.—*L. trifurcatum* Lamk.—*L. cuneatum* Mœnch. *Meth.* 79.

[8] Koch, *Umb.* 134.—DC. *Prodr.* iv. 246, n. 1.—*Ligusticum aquilegifolium* W. *Spec.* i. 1425.—*Oreoselinum lusitanicum* T.—*Sison sylvaticum* Brot.—*Danaa aquilegifolia* All.—*Smyrnium nudicaule* Bieb.—*Pimpinella Danaa* Bieb. *Casp.* 163.

[9] L. *Spec.* 358.—Hayn. *Arzn. Gew.* vii. t. 10.—Sow. *Engl. Bot.* t. 939.—Caz. *Pl. Méd. Indig.* (edit. 3) 190.—Gren. et Godr. *Fl. de Fr.* i. 696.—Rosenth. *op. cit.* 548.—H. Bn. *Dict. Encycl. Sc. Méd.* ix. 117.—*H. proteiforme* Cr.—*Sphondylium Branca-ursina* Hoffm. *Umb.* 131.

[10] L. *Mantiss.* 354.—*H. flavescens* Bahmg. *Fl. Trans.* i. 214.—DC. *Prodr.* iv. 191, n. 4.

[11] Presl. *Del.* 135.—DC. *Prodr.* n. 13.

[12] Michx. *Fl. Bor.-Amer.* i. 166.—DC. *Prodr.* n. 12.—Bigel. *Fl. Bost.* 67.

United States as a diuretic, expectorant, antidyspeptic, and even antiepileptic. In Kamtschatka choice alcoholic liquors are made from the stems of *H. Panaces.*[1] *H. gummiferum,*[2] a Caucasian species, was thought at one time to furnish the gum ammoniac. Many other species of *Heracleum* have been employed either as alimentary or aromatic.[3]

The plants of *Meum* are almost all stimulant, slightly tonic, digestive. *M. athamanticum*[4] (fig. 100, 101), or Alpine Fennel, was formerly used in theriacal composition. The fruit was considered febrifuge, emmenagogic, diuretic, carminative, expectorant. It has been extolled as a remedy for flux, asthma, chronic bronchitis, typhoid fever.[5] *M. Silaus*[6] is diuretic; its root, fruit and juice were used. *M. scoticum*[7] is used in Kamtschatka to prepare fish. *M. diffusum*[8] has an aromatic fruit employed in India in the treatment of diseased cattle. *M. venosum*[9] is reported a medicinal plant in Siberia. *M. nodiflorum,*[10] a plant of Dauphiné and the north of Italy, believed to be the *Ligusticum* of the ancients, is carminative and emmenagogic; it is sometimes substituted for *Angelica.* *M. resinosum*[11] in Italy yields from its incised root, abundance of a

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[1] L. *Spec.* 358.—DC. *Prodr.* n. 15.—Rosenth. *op. cit.* 549.

[2] W. *Enum.* 312; *Hort. Berol.* i. t. 53, 54.

[3] Particularly *H. angustifolium* L. *tuberosum* Mol. *longifolium* Jacq. *flavescens* Baumg. (Rosenth. *op. cit.* 549).

[4] Jacq. *Fl. Austr.* t. 303.—DC. *Prodr.* iv. 162, n. 1.—Gren. et Godr. *Fl. de Fr.* i. 701.—Rosenth. *op. cit.* 539.—*Athamantha Meum* L. *Spec.* 353.—*Seseli Meum* Scop. *Fl. Carn.* n. 352. *Ligusticum Meum* All. *Fl. Ped.* ii. 12.—DC. *Fl. Fr.* iv. 310.

[5] *M. Mutellina* Gærtn. (*Phellandrium Mutellina* L.—*Ligusticum Mutellina* All.—*Æthusa Mutellina* Lamk.) in our opinion generically inseparable from the preceding, forms part of the roots of *Meum* found in commerce. The young shoots serve as vegetables in the Alps.

[6] *Peucedanum Silaus* L. *Spec.* 354.—Jacq. *Fl. Austr.* t. 15.—Hayn. *Arzn. Gew.* vii. t. 5.—*Sium Silaus* Roth.—*Cnidium Silaus* Spreng.—*Ligusticum Silaus* Duby.—*Seseli pratensis* Riv.—*S. sellnoides* Jacq.—*Silaus pratensis* Bess. *Sch. Syst.* vi. 36, not.—Koch, *Umb.* 105.—DC. *Prodr.* iv. 161.—Rosenth. *op. cit.* 539.

[7] *Ligusticum scoticum* L. *Spec.* 359.—DC. *Prodr.* iv. 137, n. 1.—*Angelica scotica* Lamk.—*Seseli scoticum* Riv.—*Apium ternatum* W.

[8] *Ligusticum diffusum* Roxb. *Cat. Hort. Calc.* 21.—*Athamantha diffusa* Wall.—*Cnidium diffusum* DC. *Prodr.* iv. 153, n. 7.

[9] *Seseli venosum* Hoffm. *Fl. Germ.* 144.—*S. selinoides* Bess.—*S. alpinum* Bieb.—*Cnidium venosum* Koch, *Umb.* 109.—DC. *Prodr.* n. 4.—*Selinum pratense* Spreng.

[10] *Smyrnium nodiflorum* All. *Fl. Pedem.* ii. 23, t. 2.—*Ligusticum nodiflorum* Vill.—*Angelica paniculata* Lamk.—*Laserpitium verticillatum* Waldst. et Kit.—*Trochiscanthes nodiflorus* Koch, *Umb.* 103.—DC. *Prodr.* iv. 154.—Rosenth. *op. cit.* 538.

[11] H. Bn. *Bull. Soc. Linn. Par.* 185.—*Laserpitium resinosum* Presl. *Fl. Sic.* 136.—*Ligusticum resinosum* Guss. *Ind. Sem.* (1826); *Prodr. Fl. Sic.* i. 335.—*Bonannia resinifera* Guss. *Fl. Sic. Syn.* i. 335.—*Ligusticum Græcum Apii folio* T. *Inst. Cor.* 23.

milky and aromatic juice.[1] *Seseli* has the same property and its dried juice resembles *opopanax*. Especially is this the case with *S. gummiferum*[2] (fig. 115, 116), in Tauris. *S. tortuosum*[3] has an aromatic, bitter, digestive, stomachic fruit, sometimes still employed as a carminative in rural districts. *S. Hippomarathrum*[4] has the same properties, and *S. Libanotis*[5] is employed in Switzerland as an aromatic and vulnerary plant. *S. macedonicum*,[6] a Mediterranean species, is vulnerary and its fruit diuretic and carminative. In the south its leaves are placed with clothes to protect them from the attacks of insects. The young shoots are sometimes eaten as vegetables. *Athamanthi Matthioli*[7] (fig. 117) has also an edible root and serves the same purposes as *Meum athamanthicum*. *A. cretensis*[8] has diuretic, diaphoretic and stimulant fruit.[9] *A. sicula*[10] and *cervariæfolia*,[11] types of the genus *Tinguarra* with some authors, have fruit with precisely the same properties. The root is said to be eaten like celery. *Cachrys* is little employed, though possessing similar virtues. *C. secula*[12] is aromatic and emmenagogic. *C. cretica*[13] has diuretic, carminative, tonic fruit; its root is aromatic. *C. odontalgica*,[14] from northern Asia, derives its name from the use to which its root is applied. *C. Libanotis*,[15] from the Mediterranean region, is astringent and tonic. *C. ferulacea*,[16] an oriental species, has an aromatic bitter

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[1] *Thaspium barbinode* Nutt. and *atropurpureum* Nutt., which we refer to this same genus, are reputed vulnerary and antisyphilitic in the United States.

[2] Smith, *Exot. Bot.* t. 120.—DC. *Prodr.* iv. 145, n. 4.—*Bubon rigidus* α Spreng.

[3] L. *Spec.* 373.—DC. *Fl. Fr.* iv. 285; *Prodr.* n. 21.—Gren. et Godr. *Fl. de Fr.* i. 707.—*Sium tortuosum* Roth, *Fl. Germ.* i. 128.

[4] L. *Spec.* 373.—Jacq. *Fl. Austr.* t. 143.—DC. *Prodr.* n. 1.—*Sium Hippomarathrum* Roth.—*Seseli articulatum* Crantz.

[5] Koch, *Umb.* 111.—Gren. et Godr. *Fl. de Fr.* i. 710.—*Libanotis daucoides* Scop.—*L. montana* All.—*L. vulgaris* DC. *Prodr.* iv. 150, n. 3.—*Athamantha Oreoselinum* Huds.

[6] B. H. *Gen.* 901.—*Daucus macedonicus* Riv.—*Apium macedonicum* Mor.—*Bubon macedonicum* L. *Spec.* 364.—*Athamantha macedonica* Spreng. *Sch. Syst.* vi. 491.—DC. *Prodr.* iv. 155, n. 2.—Rosenth. *op. cit.* 538.

[7] Wulf. *Jacq. Coll.* i. 211; *Ic. Rar.* i. t. 57.—DC. *Prodr.* n. 5.—*Seseli Turbith* L. *Amœn.* iv. 310.

[8] L. *Spec.* 352.—DC. *Prodr.* n. 4.—Rosenth. *op. cit.* 538.

[9] Loureiro (*Fl. Cochinch.* [ed. 1790] 178) cites an *A. chinensis* (?) which he says is diuretic, deobstruant, emmenagogic, resolutive and very efficacious in uterine affections.

[10] L. *Spec.* 352.—DC. *Prodr.* n. 6.—*Bubon garganicum* Ten. *Fl. Nap.* i. 123.

[11] DC. *Prodr.* n. 1.—*Seseli cervariæfolium* DC. *Cat. Hort. Monsp.* 145.

[12] Sibth. *Fl. Græc.* t. 278.—*C. echinophora* Guss.—*C. cristata* DC. *Prodr.* iv. 238.—*Hippomarathrum cristatum* Boiss. *Fl. Or.* ii. 932.

[13] Lamk. *Dict.* i. 259.—*Lecokia cretica* DC. *Mém.* 67; *Prodr.* iv. 240.—*Scandix latifolia* Sibth. *Fl. Græc.* t. 284.

[14] Pall. ex DC. *Prodr.* iv. 236, n. 2.—*C. callosperma* Pall. *Voy.* iii. 663 (ex DC.).

[15] L. *Spec.* 355.—DC. *Prodr.* n. 5.—*Hippomarathrum Libanotis* Koch (ex DC.).

[16] Guss. *Prodr. Fl. Sic.* i. 358 (not L.).—*C. alata* Hoffm.—*Laserpitium ferulaceum* L. *Spec.* 358.—*Prangos ferulacea* Lindl. *Journ. Sc. Lond.* (1825) 7.—Boiss. *Fl. Or.* ii. 937.—*P. fœniculacea* C. A. Mey. *Enum.* 131.—*P. stenoptera* Boiss. et Buhse, *Aufz.* 104.

juice; it has the properties of Camomile and is used in the treatment of pulmonary and intestinal affections. *C. pabularia*,[1] of temperate Asia, has been reputed to produce *asafœtida;* it was a *Libanotis* of the ancients, used as a condiment and aliment, and employed in the treatment of uterine affections. The Carrots are alimentary and medicinal plants. *Daucus Carota*[2] (fig. 62–67) is considered the stock of our cultivated carrot whose fleshy taproot, of variable colour, supplies a food to man and beast. Its pulp has been reputed emollient, maturative. It is sometimes used to colour butter. The ancients considered it aperitive, and, perhaps on account of its colour, a remedy for jaundice. The fruit is aromatic, but little used. The flowers are employed in dyeing various colours and formerly a liquor was made from them called *oil of Venus*. Of *D. maritimus* only the young shoots are edible. *D. grandiflorus*[3] is aromatic and diuretic. *D. guttatus*[4] was a medicinal plant with the Greeks. *D. gummifer*[5] produces a gum-resin substituted for *Bdellium* and *Opopanax*. *D. latifolia*[6] has edible shoots, also *D. Royeni* (fig. 69),[7] considered diuretic in some districts. In central America, *Arracacia* is celebrated for an edible root, chiefly that of *A. xanthorhiza*,[8] eaten in Columbia, boiled like our potato; from it is extracted an analeptic starch resembling arrowroot; a fermented liquor is likewise made from it, said to be stomachic. *A. moschata* has the same uses in Mexico. *Tordylium*[10] *officinale* and *apulum*[11] have edible shoots; the fruit was reputed salutary in stone and renal maladies. In the north of Persia,

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[1] Lindl. *Journ. Sc. Lond.* (1825) n. 37, 7.—DC. *Prodr.* iv. 239, n. 1.

[2] L. *Spec.* 348.—DC. *Prodr.* iv. 211, n. 9.—Gren. et Godr. *Fl. de Fr.* i. 665.—Mér. et Del. *Dict. Mat. Méd.* ii. 599.—Nees et Eberm. *Pl. Med.* t. 287.—Hayn. *Arzn. Gew.* vii. t. 3.—Lindl. *Fl. Med.* 53.—Guib. *loc. cit.* 205.—Caz. *Pl. Méd. Indig.* (ed. 3) 252.—*D. vulgaris* Neck. —*Caucalis Carota* Crantz.

[3] Scop. *Fl. Carniol.* i. 189.—*Caucalis grandiflora* L. *Spec.* 346.—Lamk. *Ill.* t. 192, fig. 1.—*Orlaya grandiflora* Hoffm. *Umb.* i. 58.—DC. *Prodr.* iv. 209, n. 1.

[4] Sibth. ex Rosenth. *op. cit.* 553.

[5] Lamk. *Dict.* i. 634.—Gren. et Godr. *Fl. de Fr.* i. 668.—*D. maritimus* Wieh. (not Lamk.).

[6] *Tordylium latifolium* L. *Spec.* 545.—*Caucalis latifolia* Reichb. — *Turgenia latifolia* Hoffm. *Umb.* 59.—DC. *Prodr.* iv. 218.—Gren. et Godr. *Fl. de Fr.* i. 673 (*Gratteau*).

[7] *Conium Royeni* L. *Spec.* 340.—*Caucalis daucoides* L. *Mantiss.* 351.—DC. *Prodr.* iv. 216, n. 1. —*C. leptophylla* Lamk. (not L.).

[8] Bancr. *Gart. Dir.* 382; *Hort. Soc. Jam.* ex *Linnæa* (1829) Litt. 13.—*A. esculenta* DC. *Prodr.* iv. 244, n. 1.—Mér. et Del. *Dict. Mat. Méd.* i. 376.—H. Bn. *Dict. Encycl. Sc. Méd.* v. 772.—*Conium Arracacha* Hook. *Exot. Fl.* t. 152; *Bot. Mag.* t. 3092.

[9] DC. *Prodr.* n. 2.—*Conium moschatum* H.B.K. *Nov. Gen. et Spec.* v. 14, t. 420 (*Sacharachaca*, in the province of los Pastos).

[10] L. *Spec.* 345.—DC. *Prodr.* iv. 198, n. 4.—? *T. microcarpum* Ten.—*Condylocarpus officinalis* Koch.

[11] Riv. *Pent.* t. 2.—DC. *Prodr.* n. 5.

Diplotænia cachrydifolia[1] supplies fodder for horses. *Aciphylla glacialis*[2] is utilized in Australia as an alimentary root. At the Cape *Anesorhiza capensis*[3] is a potherb.[4] Several species of *Bupleurum* are useful: *B. falcatum*[5] (fig. 131), formerly employed in the treatment of fevers and wounds; *B. fruticosum*,[6] esteemed by the Greeks as emmenagogic, diuretic, anticatarrhal; *B. aristatum*,[7] extolled in the Tyrol as odontalgic; *B. rotundifolium*[8] (fig. 132) and *protractum*,[9] employed against wounds, tumours and scrofulous affections. The young shoots are said to be edible. Along most of our coast the stems and leaves of *Crithmum maritimum*[10] (fig. 109, 110) are eaten as pickles, and are reputed aromatic, depurative and diuretic.[11]

What may be termed the abnormal *Umbelliferæ*, that is, those of the series *Hydrocotyleæ* and *Araliеæ*, include relatively but a small number of useful plants. Our common Pennywort[12] (fig. 157) has been reputed resolutive, detersive and vulnerary; it is scarcely used. But *Hydrocotyle asiatica*[13] (fig. 158–161) has for some years formed the subject of numerous publications as a sovereign remedy for inveterate affections of the skin, even of those of a syphilitic nature. The Indians also extol it as diuretic. With them it is a potherb. *H. bonariensis*[14] and *H. umbellata*[15] are employed in South America, the former in cutaneous eruptions, the latter in liver and renal mala-

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[1] Boiss. *Fl. Or.* ii. 981.

[2] Benth. *Fl. Austral.* iii. 375, n. 2.—*Gingidium glaciale* F. Muell. *Trans. Phil. Inst. Vict.* i. 104. *A. latifolia* and *antipoda*, of the antarctic regions are no longer numbered among economic plants in our country.

[3] Cham. et Schlchtl, *Linnæa*, i. 398.—Harv. and Sond. *Fl. Cap.* ii. 545. *Capnophyllum peregrinum* (*Krubera leptophylla* Hoffm.) has an aromatic edible root.

[4] *Vlackte Anyswortel* of the planters.

[5] L. *Spec.* 341 (*Hare's Ear*).

[6] L. *Spec.* 344.—Gren. et Godr. *Fl. de Fr.* i. 725.—*Tenoria fruticosa* Spreng.

[7] Barth. *Reichb. Icon.* ii. 70, t. 178.—*B. divaricatum* Lamk. *Fl. Fr.* iii. 410.—*Odontites luteola* Spreng. *Sch. Syst.* vi. 380.

[8] L. *Spec.* 340.—DC. *Prodr.* n. 17.—Hayn. *Arzn. Gew.* vii. t. 1.

[9] Link, *Fl. Portug.* ii. n. 387.—*B. subovatum* Spreng.—*Diaphyllum triradiatum* Hoffm. *B. perfoliatum* Lamk. is also employed as astringent, vulnerary, and *B. petiolare* DC. as astringent and febrifuge.

[10] L. *Spec.* 354.—Jacq. *Hort. Vindob.* t. 187.—Sow. *Engl. Bot.* t. 819.—DC. *Prodr.* iv. 164.—Mér. et Del. *Dict.* ii. 466.—Gren. et Godr. *Fl. de Fr.* i. 700.—Caz. *Pl. Méd. Indig.* (ed. 3) 356.

[11] Some species of *Echinophora* are mentioned as useful: *E. trichophylla* L. as tonic depurative and healing serpent bites; *E. spinosa* has an edible root said to be similar to that of the Parsnip.

[12] *Hydrocotyle vulgaris* L. *Spec.* 338.—DC. *Prodr.* iv. 59, n. 2.—Gren. et Godr. *Fl. de Fr.* i 751.—Rosenth. *op. cit.* 524.

[13] L. *Spec.* 234.—DC. *Prodr.* n. 26.—Guib. *loc. cit.* 217.—Flück. et Hanb. *Pharmacogr.* 264 (*Codagam*, *Kutakan*). Its active principle is called *vellarine*. *H. rotundifolia* Roxb. of India is sometimes substituted for it.

[14] Lamk. *Dict.* iii. 147.—DC. *Prodr.* n. 7.

[15] L. *Spec.* 234.—DC. *Prodr.* n. 6.—*H. umbellata* Pursh.

dies. Its preserved root serves as a masticatory and its fresh juice is emetic. *H. canadensis*,[1] *H. citriodora* R. and Pav., in Peru, and *H. moschata* Forst., in New Zealand, are reputed aromatic. At the Cape *H. Bupleurifolia*[2] is accounted astringent, antidiarrhœic. *H. montana* Cham. and Schlchtl, has the same properties. Our common Sanicle[3] (fig. 177, 178) enjoyed an exaggerated reputation among the ancients as vulnerary, astringent, tonic, but is now scarcely used. The American Sanicle[4] appears more active; it has been extolled against pulmonary affections and syphilis. Of its fibres are made setons for horses.[5] *Astrantia major*[6] (fig. 173–175) and some neighbouring species have had the same uses as Imperatoria. Its stumps are purgative and furnish an antidote to Black Hellebore; they are also slightly aromatic. The Eryngos have enjoyed a great reputation in medicine. Our Field[8] and Sea[9] Eryngo (fig. 170–172) have a sweetish, aromatic and tonic root. They were ranked among the best aperitives and diuretics, and were extolled against chronic affections of the viscera, particularly of the liver, amenorrhœa, blennorragia, œdema of the limbs. The young shoots are said to be edible. Quacks sold them, dried or preserved, as aphrodisiac and also to arrest the secretion of milk after childbirth. The flowers of *E. planum*[10] are employed as sudorific in Siberia. *E. dichotomum*, *græcum*, *viride*, *tricuspidatum*, *ternatum*, *dilatatum* and *amethystinum* are said to have the same properties. In America, *E. virginianum*, *mexicanum*, *longifolium*, *bromeliæfolium*, are considered diuretic, emmenagogic, alexipharmic. *E. aquaticum*[11] is a *Contrayerva* of Mexico.

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[1] Pursh, ex Rosenth. *op. cit.* 525.

[2] Rich. *Mon. Hydroc.* n. 55, fig. 39 (var. [DC.] of *H. Centella* Cham. et Schlchtl).

[3] *Sanicula europæa* L. *Spec.* 339.—DC. *Prodr.* iv. 84, n. 1.—Gren. et Godr. *Fl. de Fr.* i. 757.—Guib. *loc. cit.* 217.—Caz. *Pl. Méd. Indig.* (ed. 3) 949.—*Astrantia Diapentia* Scop.—*Caucalis Sanicula* Crantz.

[4] L. *Spec.* 339.—Lamk. *Ill.* t. 191, fig. 2.—Bigel. *Fl. Bost.* (ed. 2) 109.

[5] The same qualities are ascribed to *S. canadensis* L. (*Spec.* 339).

[6] L. *Spec.* 339.—Nees, *Off. Pfl.* xii. t. 6.—Hayn. *Arzn. Gew.* i. t. 13.—Sm. *Exot. Bot.* t. 76.—DC. *Prodr.* iv. 86, n. 4.—Lindl. *Fl. Med.* 33. *A. nigra* Lob.—*Helleborus niger* Garid. (not L.).

[7] *A. minor* L. *carniola* Wulf. *intermedia* Bieb &c.

[8] *Eryngium campestre* Dod. *Pempt.* 730.—L. *Spec.* 337.—Hayn. *Arzn. Gew.* vii. t. 1.—Gren. et Godr. *Fl. de Fr.* i. 756.—Guib. *loc. cit.* 215, fig. 618.—Caz. *Pl. Méd. Indig.* (ed. 3) 275.

[9] *E. maritimum* C. Bauh. *Pin.* 386.—L. *Spec.* 337.—DC. *Prodr.* iv. 89, n. 15.—Turp. *Dict. Sc. Nat.* Atl. t. 112.—Gren. et Godr. *Fl. de Fr.* i. 757.

[10] Math. *Comm.* 505.—L. *Spec.* 337.—DC. *Prodr.* n. 19.—Rosenth. *op. cit.* 526.

[11] L. *Spec.* 336.—Jacq. *Ic. Rar.* t. 347.—DC. *Prodr.* n. 59.—*E. yuccæfolium* Michx. *Fl. Bor.-Amer.* i. 164.

E. fœtidum [1] is considered a febrifuge in South America. In Brazil *E. Lingua Tucani* MART. is used in the treatment of aphtha, stomatitis. Many species in the temperate regions of South America have leaves resembling those of the *Bromeliaceæ*, *Pandaneæ*, and some *Gramineæ*, whence they have derived their specific names, and are ornamental.[2] *Azorella*,[3] curious Andean plants whose habit, almost always exceptional, becomes sometimes absolutely strange, is rich in a sort of aromatic, stimulant gum with terebinthine odour. That of *A. glebaria* [4] heals sores and has been substituted for copahu as antiblennorrhagic. *A. madreporica* [5] is used in Chili in the treatment of cephalalgea. *A. Gilliesii* [6] has alimentary roots.[7] *Asteriscium chilense* [8] is aromatic, tonic and carminative. At the Cape *Arctopus echinatus* [9] has the same properties.

The fruits of *Myodocarpus*, rich in gum-resinous reservoirs, are extremely aromatic and from them a perfumed juice might be extracted. The *Aralias* are mentioned, some as tonic, others as diaphoretic. *A. edulis*,[10] which derives its specific name from the use made of the young shoots in China and Japan, has bitter aromatic roots. In North America, *A. hispida* [11] has the same uses as Sarsaparilla and is sometimes employed to adulterate it. The same may be said of *A. nudicaulis*,[12] from the same country, and of *A. racemosa* [13] and *spinosa*.[14] *Ginseng* comprises the most celebrated of these plants

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[1] L. *Spec.* 336 (part).—MICHX. *loc. cit.* 163.—DC. *Prodr.* n. 54.—ROSENTH. *op. cit.* 1139. According to B. SEEMANN, it is a culinary plant at Panama.

[2] See A. GRAY, *Sillim. Journ.* (1874) 443.

[3] See H. BN. *Dict. Enc. Sc. Méd.* vii. 683.

[4] *A. cæspitosa* VAHL, *Symb.* iii. 48.—*Bolax glebaria* COMMERS. ex GAUDICH. *Ann. Sc. Nat.* ser. 1, v. 104, t. 3, fig. 2.—DC. *Prodr.* iv. 78, n. 1.—ROSENTH. *op. cit.* 1138.—*B. gummifera* SPRENG.—*B. complicata* SPRENG.—*Hydrocotyle gummifera* LAMK. *Dict.* iii. 156; *Ill.* t. 189, fig. 21.

[5] CLOS. *C. Gay Fl. Chil.* iii. 79 (*Llareta de Coquimbo*). This species is employed especially by the shepherds of the Andes; it is rich in resinous matter, and forms on the top of the mountains a thick rigid covering which from a distance hardly appears of a vegetable nature.

[6] HOOK. *Bot. Misc.* iii.—C. GAY, *loc. cit.* 84.—*Bolax Gilliesii* HOOK. *loc. cit.* t. 63.

[7] It is said to constitute often the only nourishment of the herdsmen of the Andes.

[8] CHAM. et SCHLCHTL. *Linnæa* (1826), 254, t. 5.—HOOK. *Bot. Misc.* i. 332, t. 68.—C. GAY, *op. cit.* 100.—*Anisillo* FEUILL. *Journ. Obs.* iii. 5, t. 2 (*Muchu* of the Chilians).

[9] L. *Spec.* (ed. 2) ii. 1512.—THUNB. *Fl. Cap.* 255.—KER, *Bot. Reg.* t. 705.—DC. *Prodr.* iv. 236.—HARV. and SOND. *Fl. Cap.* ii. 564.—H. BN. *Dict. Encycl. Sc. Méd.* vi. 38.

[10] SIEB. et ZUCC. *Fl. Jap.* i. 57, t. 25.—SEEM. *Journ. Bot.* vi. 134.—*A. cordata* THUNB. ?—*Dimorphanthus edulis* MIQ. *Comm. Phyt.* 26.

[11] MICHX. *Fl. Bor.-Am.* i. 185.—VENT. *H. Cels.* t. 41.—LODD. *Bot. Cab.* t. 1306.—TORR. et GR. *Fl. N.-Amer.* i. 647.—SIMS, *Bot. Mag.* t. 1041 (*Bristly Sarsaparilla, Wild Elder* of the Americans).

[12] L. *Spec.* 393 (not BL.) —RAFIN. *Med. Bot.* i. t. 8.—TORR. et GR. *Fl. N.-Amer.* i. 646 (*wild Sarsaparilla*).

[13] L. *Spec.* 393 (*Spinenard*).

[14] L. *Spec.* 392.—TORR. et GR. *loc. cit.* 647 (*Angelica-tree, Prickly Ash*).

for their pretended restoring and aphrodisiac virtues, and for the form of the root which, as in *Mandragora*, resembles more or less exactly that of the human body. They are stimulant, astringent and analeptic plants; the leaves are used for making tea. The true *Ginseng* of China, which has given rise to so many fabulous accounts, and been introduced into Japan, is *Aralia Ginseng* [1] (fig. 185, 186), but it is not certain that it is other than a form of *A. quinquefolia*,[2] a plant of North America, observed from Canada to the south of the United States, which produces the American Ginseng, endowed with the same virtues as the Asiatic.[3] *A. polaris*,[4] a singular species from the antarctic islands, is used as a potherb in those desolate lands and especially as fodder for beasts; the animals eat the blackish drupes (fig. 189, 190). *A. papyrifera*,[5] a fine species from Formosa, cultivated as an ornamental plant, is used for making the *Rice paper* of China, employed in the arts and in industry;[6] it is prepared from the pith, the cylinders of which are cut in a spiral direction into large thin sheets afterwards smoothed and flattened. *Heteropanax fragrans*,[7] of China and India, a near generic neighbour of the preceding, is an aromatic species, as is also *Didymopanax Morototoni*,[8] a species from Guyana. Some plants of *Panax* are useful; *P. fruticosum*,[9] from Java and the Moluccas, introduced into most tropical countries, is employed in the treatment of fevers, flux, and its leaves are eaten as Parsley; *P. cochleata*,[10] from the same countries and with the same properties, is used for throat affections; *P. pinnata* [11] (fig. 205), a

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[1] *Panax Ginseng* C. A. Mey. *Bull. Pétersb.* i. 340.—Seem. *Journ. Bot.* ii. 320; vi. 54.—*P. quinquefolium*, β. *coreense* Sieb. *Verh. Bot. Gen.* xii.—*P. Schinseng*, var. *coreense* Nees, *Suppl. Pl. Med.* i. t. 16 A.

[2] A. Gray, ex Seem. *Journ. Bot.* vi. 138.—*Panax quinquefolium* L. *Spec.* 1512.—C. A. Mey. *loc. cit.* 340.—DC. *Prodr.* iv. 252, n. 1 (part).—*Aureliana canadensis* Lafit. (See p. 155, note 1.)

[3] The same qualities are ascribed to *A. trifolia* (*Panax trifolium* L.) or *Dwarf Ginseng* of the Americans, and to *A. Pseudo-Ginseng* (*P. Pseudo-Ginseng* Wall.), mountain species of India. (See *Pharmac. Centralblatt* [1832], 353, t. 3.)

[4] See p. 154, note 5.

[5] See p. 154, note 4.

[6] On the history, mode of preparation of this paper, &c. see Hook. *Kew Journ. Bot.* iv. 53, t. 1, 2.

[7] Seem. *Fl. Vit.* 114, note; *Journ. Bot.* v. 239. —*Panax fragrans* Roxb. *Cat. Hort. Calc.* 21.—DC. *Prodr.* iv. 254 (part).

[8] Dcne. et Pl. *Rev. Hort.* (1854) 109.—Seem. *Journ. Bot.* vi. 131.—*P. Morototoni* Aubl. *Guian.* ii. 949, t. 360.

[9] L. *Spec.* 1513.—Andr. *Bot. Repos.* t. 595.—DC. *Prodr.* iv. 254, n. 25.—*Scutellaria tertia* Rumph.—*Nothopanax fruticosum* Miq.

[10] DC. *Prodr.* n. 7.—*P. scutellarioides* Reinw. (ex DC.)—*Aralia cochleata* Lamk. *Dict.* i. 224. —*Nothopanax cochleatum* Miq.

[11] *P. Heyneanum* Wall. *Cat.* n. 4927.—Don, *Gen. Syst.* iii. 383.—*P. Forsteri* Dcne. et Pl. *loc. cit.* 105.—*Polyscias pinnata* Forst. *Gen.* 64, t. 32; *Prodr.* n. 518.—*Aralia Polyscias* Spreng. —*Nothopanax tricochleatum* Miq. *Panax Manguette* Vieill. which is found in New Caledonia only near habitations and used by the natives as a medicine, is probably the same plant.

very odorous species cultivated nearly throughout Polynesia to supply the natives with a stimulant and tonic medicine. The Ivies have been esteemed in medicine. The wood and fruit of our common Ivy [1] (fig. 208–218) are reputed purgative, diaphoretic and evacuant. Its root was used in cutaneous and parasitic maladies; the leaves served as a dressing for wounds, burns and issues. But the bitter, aromatic, stimulant and tonic resin extracted from the stem [2] was especially prized. The place which the Ivy, a plant consecrated to Bacchus, held among the symbols of ancient mythology is well known. It plays a great part in the decoration of our gardens, where are cultivated, as ornamental plants, some large herbaceous *Umbelliferæ*, such as *Heracleum*, *Angelica*, *Ferula*. But the plants of this family most remarkable for their habit and leaves are the greenhouse *Aralieæ* now abundant in our conservatories, particularly *A. japonica* and *papyrifera*, *spinosa*, *edulis*, *mandshurica*, the Oceanic *Panax*, *Didymopanax*, *Meryta*, *Schefflera*, *Gastonia*, *Cussonia*,[3] and the beautiful climbing *Plerandra*, native of the forests of eastern India, which has received the generic name of *Tubidanthus*.

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[1] *Hedera Helix* L. *Spec.* 292.—DC. *Prodr.* iv. 261.—Sow. *Engl. Bot.* t. 1267.—Koch, *Syn. Fl. Germ.* 321.—Seem. *Journ. Bot.* ii. 306.—Mér. et Del. *Dict. Mat. Méd.* iii. 456.—Guib. *loc. cit.* 183.—Caz. *Pl. Méd. Indig.* (ed. 3) 583.—H. Bn. *Dict. Encycl. Sc. Méd.* ser. 2, ii. 550.—*H. poetica* C. Bauh.—*H. Dionysias* J. Bauh.—*H. poetarum* Bertol.—*H. chrysocarpa* Walsh.—*H. communis* Gray, *Arr. Brit. Pl.* (1821) 491.

[2] The fruit is emeto-cathartic, febrifuge, emmenagogic. It is reported to have been extolled at the time of the great plague of London. It is used to kill vermin. The branches and leaves have been employed in tanning. The porous wood of the roots forms filters. Shoemakers sharpen their knives on it.

[3] At the Cape *C. paniculata* is esteemed for its wood, which, not being very hard, is used in cabinet-work. In the Moluccas *Osmoxylon umbelliferum* (*O. amboinense* Miq.—*Aralia umbellifera* Lamk.) is mentioned for its odorous wood, from which is extracted a useful gum-resin called *Saruru* (whence by corruption the name *Gastonia saururoides* Roxb. this plant having nothing in common with *Saururus*).

GENERA.

I. DAUCINEÆ.

1. **Daucus** T.—Flowers hermaphrodite or polygamous, regular or oftener (the exterior of the inflorescence) irregular; receptacle saclike compressed ovoid, bearing adnate germen within and at the margin the perianth and stamens. Calyx very small 5-toothed or 0. Petals generally unequal and the larger the more anterior, obovate-cuneate or rather broader at the base; inflexed, induplicate or involute at the point; on account of the impressed rib above emarginate or more or less deeply 2-lobed; in prefloration reduplicate-valvate. Stamens 5, inserted with the perianth under the margin of the stylopod; filaments inflexed; anthers short or sub-2-dymous, 2-celled, introrse or 2-rimose to margin. Germen inferior, 2-celled. Ovule in cells 1, descending; funicle rather long; micropyle extrorsely superior. Styles 2, short or elongate, slender, erect or recurved, stigmatose at apex, externally at base dilated to thick conical depressed or pulvinate stylopod, entire undulate or crenate at margin. Fruit oval or oblong, transversely subterete or dorsally or more rarely laterally slightly compressed; mericarps plane or sulcate on face; primary and secondary dorsal ridges vertically somewhat prominent; the latter always stronger; all or the secondary only aculeate or setiferous or muriculate; the prickles of the primary ridges oftener short, 1–∞-setose; of the secondary larger, 1–2- or more rarely 3-seriate, dilated at base; apex rigid or sharp-pointed, straight or hooked; at base sometimes more or less connate in a wing. Vittæ solitary in secondary ridges, sometimes very thin. Carpophore undivided or 2-fid. Fruit sometimes (*Ammiopsis*) oblong-ovate, rather compressed laterally; commissure slightly constricted; ridges of subterete mericarps very little prominent; secondary prominent granulately rugose; vittæ

under these solitary more or less evolute, sometimes very thin or 0; carpophore "undivided;" stylopods depressed conical and entire. Seed semiterete or transversely oblong, face flat or rather convex, sometimes in middle slightly or deeply sulcate or concave (*Ammiopsis*), more rarely more or less involute; coat thin; albumen horny; cotyledons of small inverted subapicular embryo short; radicle terete superior.—Annual or biennial herbs, oftener odorous, glabrous or setosely or coarsely pubescent or hispid; root sometimes thick conical. Leaves alternate, pinnately decompound; segments narrow or linear; petiole dilated at base to a sheath; flowers in compound terminal or oppositifolious umbels; rays few or ∞, sometimes short, at maturity open or oftener incurved connivent; bracts of involucre few or 0, sometimes ∞, entire or broadly membranous, sometimes all or part dissected; bracteoles of involucels few or ∞, entire or 3-fid, sometimes dissected (*Ammiopsis*), sometimes 0. (*All cold and temp. regions.*)—See p. 84.

2. **Psammogeton** Edgew.[1]—Flowers nearly of *Daucus;* calyx scarcely perceptible; petals unequal, broad obovate, from impressed rib above and dilated margin spuriously 2-lobed; styles slender; stylopods conical entire. Fruit subovoid; mericarps semiterete. Carpophore 2-fid. Primary and secondary ridges filiform; the former more prominent; all 1-seriately sprinkled with rather long filiform hairs, capitate at apex; vittæ solitary under secondary ridges. Seed somewhat compressed; face flat or rather concave. Other characters of *Daucus*.—A glabrous or canescent annual; leaves twice or thrice 3-sect; laciniæ small linear; flowers[2] in compound umbels; involucres and involucels membranous-∞-bracteate. (*Persia, E. Indies.*[3])

3. **Exoacantha** Labill.[4]—Flowers hermaphrodite (nearly of *Daucus*); calyx inconspicuous or 0; petals subequal; point inflexed; spuriously 2-lobed from intruded rib. Stylopods pulvinate, subentire. Primary and secondary ridges slightly obtusely prominent, subequal or the latter rather smaller. Vittæ thin solitary in furrows. Carpophore 0. Face of seed nearly flat.—Glabrous annuals; leaves pinnate; segments of upper entire; umbels compound; rays unequal,

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[1] *Trans. Linn. Soc.* xx. 57.—B. H. *Gen.* 929, n. 147.—Hook. *Fl. Ind.* ii. 719.

[2] White or pink.

[3] Spec. 3. Boiss. *Ann. Sc. Nat.* ser. 3, i. 131 (*Pimpinella*); *Diagn. Or.* ser. 2, ii. 99 (*Torilis*); *Fl. Or.* ii. 1078. — Walp. *Ann.* i. 355.

[4] *Icon. Pl. Syr.* dec. i. 10, t. 2.—DC. *Prodr.* iv. 235.—Endl. *Gen.* n. 4523.—B. H. *Gen.* 927, n. 143.

in fruit much incurved connivent; bracts of involucre spinescent accrete rigid unequal; of involucels ∞; the exterior oftener rigidly spinescent and long open.[1] (*The East.*[2])

4. **Cuminum** L.[3] — Flowers oftener hermaphrodite; receptacle tubular. Sepals 5, unequal subulate. Petals unequal. Fruit oblong, pointed top and bottom, laterally sub-compressed. Mericarps subterete, slightly constricted at commissure, somewhat compressed dorsally. Primary ridges 5, equal, filiform, scarcely prominent, either glabrous (*Trepocarpus*[4]), or, with the secondary, oftener papillose-hispid (*Eucuminum*); secondary generally stronger subequal-linear, sometimes indurate (*Trepocarpus*). Vittæ under secondary ridges solitary thin or thick. Stylopods small, depressed conical. Seed semiterete, face rather concave. — Annuals, sometimes odorous, slender; leaves pinnately decompound or ternately dissected, glabrous; segments linear; umbels[5] compound; bracts and bracteoles of involucres and involucels slender or setaceous, entire or more rarely 3-fid. (*The East, N. America.*[6])

5. **Artedia** L.[7]—Flowers nearly of *Daucus;* petals generally very unequal.[8] Germen dorsally much compressed; stylopods pulvinate or depressed conical, oftener entire at margin. Fruit oval, much compressed at septum; margins (in secondary lateral ridges) expanded to a wing continuous with flat commissure and deeply divided into obtrapezoidal spathulate lobes. All the primary and the dorsal secondary ridges linear slightly prominent. Vittæ under secondary ridges solitary, broad, thin or subnil. Carpophore 2-fid or 2-partite;

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[1] A plant hence in fruit analogous to *Coriandrum*, in inflorescence to *Daucus* and *Ammiopsis*, from its spinescent bracts of carduaceous appearance not unlike also some *Echinophoræ*.

[2] Spec. 1. *E. heterophylla* Labill.—Boiss. *Fl. Or.* ii. 1069.

[3] *Gen.* n. 351.—J. *Gen.* 221.—Lamk. *Dict.* ii. 224; *Ill.* t. 194.—Gærtn. *Fruct.* i. 107, t. 23.—Spreng. *Prodr. Umbell.* 25.—Koch, *Umbell.* 81.—Hoffm. *Umbell.* ed. 2, 194.—DC. *Prodr.* iv. 201 (part).—Spach, *Suit. à Buffon*, viii. 149.—Endl. *Gen.* n. 4488.—B. H. *Gen.* 926, n. 140.—Hook. *Fl. Ind.* ii. 717.

[4] Nutt. ex DC. *Mém. Ombell.* 56, t. 14; *Prodr.* iv. 201.—Endl. *Gen.* n. 4489.—B. H. *Gen.* 926, n. 141.

[5] Flowers white.

[6] Spec. 2, one of which very common, very likely the *C. Cyminum* L. cultivated everywhere in the East. (See p. 188, note 4.)

[7] *Gen.* n. 332.—Lamk. *Dict.* i. 276; *Ill.* t. 173.—Spreng. *Umb. Prodr.* 18.—Lag. *Amœn.* ii. 90. Koch, *Umb.* 76, fig. 9, 10.—DC. *Prodr.* iv. 208; *Mém.* t. 19, fig. 7.—Endl. *Gen.* n. 4495.—B. H. *Gen.* 927, n. 144.

[8] The more external of the outer flowers longest, white.

face of seed flat or nearly so.—Annuals; habit leaves and inflorescence of *Daucus;* bracts of involucre and involucels ∞, linear or setaceo-lobed. (*West. Asia.*[1])

6. **Laserpitium** T.[2]—Flowers nearly of *Daucus;* sepals very small or 0. Stylopods conical or depressed, not or scarcely marginate. Fruit oblong; commissure not or slightly constricted; primary ridges scarcely visible or linear; secondary expanded to vertical entire or sinuate or dentate and oftener undulate wings. Lateral wings[3] generally broader than dorsal and continuous with flat commissure. Vittæ under secondary ridges solitary.[4] Carpophore 2-partite. Face of seed flat or more or less concave.—Perennial herbs; leaves pinnately or ternately decompound; bracts of involucres and involucels ∞, linear or membranous.[5] (*Europe, west. Asia, north. Africa.*[6])

7. **Thapsia** T.[7]—Flowers[8] nearly of *Laserpitium;* sepals small or scarcely visible. Stylopods various, small or conical, sometimes marginate or undulate. Fruit ovately oblong, dorsally compressed; secondary lateral ridges dilated to broad wings; dorsal linear or produced to narrow wings;[9] primary filiform scarcely prominent. Face of seed complanate (*Euthapsia*), or oftener deeply sulcate or involute (*Elæoselinum*[10]).—Perennial or dicarpic herbs; leaves pinnately decompound; segments inciso-pinnatifid or setaceous; umbels compound; bracts of involucres and involucels ∞, narrow, sometimes few or 0. (*Mediterr. reg., Madeira.*[11])

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[1] Spec. 1. *A. squamata* L. *Sp c.* 347.—Sibth. *Fl. Græc.* t. 268.—Jaub. et Spach, *Ill. Or.* t. 430.—Boiss. *Fl. Or.* ii. 1070.—*Ammi anethifolium* Ledeb. *Fl. Ross.* ii. 246 (not Lamk.).

[2] *Inst.* 324, t. 172.—L. *Gen.* n. 344 (part).—Spreng. *Prodr. Umb.* 17.—Koch, *Umb.* 74.—DC. *Prodr.* iv. 204.—Endl. *Gen.* n. 4492.—B. H. *Gen.* 929, n. 149.—*Siler* Mœnch. *Meth.* 164.—*? Laser* Baumg. *Enum. Pl. Trans.* t. 227 (ex B. H.)—*Guillonea* Coss. *Pl. Nouv. Esp.* 199 (ex B. H.).

[3] Sometimes all imperfect or decayed.

[4] Vittæ sometimes also very thin in the primary ridges.

[5] Flowers white or yellowish.

[6] Spec. about 18. Jacq. *Fl. Austr.* t. 145, 146, 153; *Ic. Rar.* t. 58, 350.—Cav. *Icon.* t. 190.—Desf. *Fl. Atl.* t. 75 (*Thapsia*).—Waldst. et Kit. *Pl. Rar. Hung.* t. 192, 253.—Reichb. f. *Icon. Fl. Germ.* t. 1985–1996.—Boiss. *Fl. Or.* ii. 1014.—Gren. et Godr. *Fl. de Fr.* i. 679.—Walp. *Rep.* ii. 418; v. 896; *Ann.* ii. 715; iii. 899 (*Guillonea*).

[7] T. *Inst.* 321, t. 171.—L. *Gen.* n. 361.—Koch, *Umb.* 74.—DC. *Prodr.* iv. 202.—Endl. *Gen.* n. 4490.—B. H. *Gen.* 930, n. 151 (part).

[8] White, yellowish or purplish.

[9] Sometimes also (abnormally) rather broad.

[10] Koch, *DC. Prodr.* iv. 215.—Endl. *Gen.* n. 4498.—B. H. *Gen.* 930, n. 152.—*Margotia* Boiss. *Elench. Pl. Hisp. Austr.* 52; *Voy.* 263, t. 79.

[11] Spec. about 7. Desf. *Fl. Atl.* t. 69, 72 (*Laserpitium*).—Sibth. *Fl. Græc.* t. 286, 287.—Bertol. *Fl. Ital.* iii. 383.—Boiss. *Voy. Esp.* t. 76–79 (*Elæoselinum*); *Fl. Or.* ii. 1007, 1068 (*Elæoselinum*).—Walp. *Rep.* ii. 417, 420 (*Elæoselinum*).

8 ? **Polylophium** Boiss.[1]—Flowers[2] of *Laserpitium*. Fruit ovoid subterete ; carpels dorsally compressed ; commissure broad. Primary and secondary ridges subequal dilated to undulately crisped fimbriate wings. Vittæ under secondary ridges solitary. Carpophore 2-partite. Seed nearly flat at back.—Glabrous perennial herbs ; leaves pinnately decompound; segments dissected; bracts of involucres and involucels ∞ , entire or incised.[3] (*The East.*[4])

9. **Melanoselinum** Hoffm.[5]—Flowers[6] of *Thapsia ;* sepals minute or 0. Stylopods depressed conical. Fruit oval or oblong oval, dorsally compressed ; commissure broad. Primary and secondary ridges conspicuous ; the latter more prominent, the former depressed, sometimes filiform ; primary lateral hidden in commissure, entire or sulcate ; secondary 4, subequally raised in each carpel, obtuse not produced to wing ; marginal thick unequally-dentate ; teeth conspicuous from base to apex (*Eumelanoselinum*), or the apical rather larger (*Monizia*[7]), sometimes obscure (*Tornabenia*[8]). Vittæ under secondary ridges solitary broad. Carpophore 2-partite. Face of seed flat.—Perennial plants herbaceous (*Tornabenia*) or with very long caudex frutescent or arborescent (*Eumelanoselinum, Monizia*) ; leaves pinnately decompound, often large ; umbels compound, ∞ -radiate ; bracts of involucres and involucels ∞ , sometimes small. (*Madeira, C. Verde Is.*[9])

II. ECHINOPHOREÆ.

10. **Echinophora** L.—Flowers polygamous ; receptacle of the fertile ovoid saclike. Sepals 5, superior, inserted in mouth of receptacle, small, acute, oftener unequal. Petals 5, alternate, unequal,

[1] *Ann. Sc. Nat.* ser. 3, ii. 47.—B. H. *Gen.* 929, n. 148.—*Acanthopleura* C. Koch, *Bot. Zeit.* (1849) 408.—Schlchtl, *Linnæa,* xxvi. 485.

[2] Greenish-yellow.

[3] Rather a sect. of *Laserpitium.*

[4] Spec. 2. Pall. *Rœm. et Sch. Syst.* vi. 447 (*Cachrys*).—Boiss. et Heldr. *Diagn. Or.* ser. 1, x. 46 (*Laserpitium*).—Fenzl. *Tchihatch. As. Min. Bot.* i. 443.—Boiss. *Fl. Or.* ii. 1066.

[5] *Umb.* (ed. 2) 156 (1814).—Koch, *Umb.* 75.—DC. *Prodr.* iv. 208.—Endl. *Gen.* n. 4494.—H. Bn. *Adansonia,* xii. 167.

[6] Whitish (?).

[7] Lowe, *Hook. Kew Journ.* viii. 295 ; *Man. Fl. Mader.* 365.—Hook. f. *Bot. Mag.* t. 5724.

[8] Parlat. *Hook. Kew Journ.* ii. 370.—J. A. Schm. *Beitr. zur Fl. Cap.-Verd. Ins.* 253.—B. H. *Gen.* 930, n. 150.—*Tetrapleura* Parlat. *Hook. Niger.* 131 (not Benth.).

[9] Spec. 4, 5. Schrad. et Wendl. *Sert. Hannov.* iii. 23, t. 43 (*Selinum*).—Hook. f. *Bot. Misc.* t. 5670 (*Thapsia*).—Walp. *Ann.* ii. 714 (*Tetrapleura*).

obovate or cuneate; inflexed at point; the interior smaller sometimes entire; the exterior spuriously 2-lobed. Stamens 5, inserted with perianth. Germen (in sterile flowers minute or 0) adnate to receptacle, inferior, 2-celled; one cell sometimes aborted; style 2-fid or 2-partite, at apex stigmatose within; stylopods conical entire. Fruit finally dry, oval, conical or subpyramidal, transversely subterete; one mericarp oftener aborted; carpophore 0 or scarcely visible; vittæ in furrows solitary or obscure, often 0. Face of seed deeply hollowed; margins more or less involute.—Perennial herbs, often rigid, rushlike or spinescent, glabrous or pubescent; leaves pinnately dissected or decompound; segments slender or filiform; sometimes incised or spinescent; flowers in compound umbels (?); the central one in each umbellule fertile sessile; the others male pedicellate; pedicels after flowering hardened with receptacle, accrescent in a short cupule (*Pycnocycla*), or higher and variously in a sac (*Euechinophora*) adnate with central fruit; calyces of sterile flowers often persistent at top of pedicel and spinulescent. (*South. Europe, north. Africa, central and west. Asia.*)—See p. 93.

III. PEUCEDANEÆ.

11. **Peucedanum** T.—Flowers hermaphrodite or more rarely polygamous; receptacle saclike, dorsally compressed. Sepals 5, small or 0. Petals more or less unequal, entire or from more or less impressed rib obtuse or spuriously 2-lobed. Stamens 5. Stylopods depressed conical or subplane, entire or undulate at dilated margin. Fruit oval, elliptical or rarely suborbicular, much compressed parallel to septum, flat or slightly convex; margin thick or rather so, sometimes pointed and narrowly or rather broadly alate, entire before dehiscence, separating late. Primary and intermediate ridges filiform, scarcely prominent. Vittæ in furrows solitary or 2–3, more rarely ∞, sometimes very thin or 0. Carpophore 2-partite. Face of seed flat or slightly concave; embryo minute or sometimes in albumen 2-lamellate rather large.—Perennial herbs, rarely annual or frutescent or arborescent; leaves pinnately or ternately decompound, rarely simply pinnate; umbels compound, sometimes cymiform at base, or sometimes in racemes; umbellules more rarely racemose. (*Warm and temp. regions of both worlds.*)—See p. 95.

12. **Heracleum** L.[1]—Flowers nearly of *Peucedanum;* sepals small or 0. Petals[2] often rayed, cuneate or unguiculate at base, spuriously 2-lobed or emarginate. Germen generally pubescent. Stylopods conical, often marginately undulate, sometimes very small. Fruit elliptical or obovate, sometimes suborbicular (of *Peucedanum*); at margin oftener not tumid, sometimes rather thickened (*Trigonosciadium*[3]); vittæ in furrows oftener solitary, rarely 2, 3, generally shorter than mericarp, more or less enlarged below, rarely equal to fruit; sometimes in addition some very thin intrajugal vittæ. Carpophore 2-partite. Seed much compressed, face generally flat. Other characters of *Peucedanum*.—Herbs, oftener perennial, either low, or oftener very high, generally pubescent, scabrous or hirsute; leaves lobed or pinnately or ternately dissected; umbels compound; bracts of involucre small or rather large (*Tordyliopsis*[4]), sometimes 0; bracteoles of involucels ∞. (*North. temp. regions of both hemispheres.*[5])

13. **Symphyoloma** C. A. Mey.[6]—Flowers nearly of *Heracleum;* petals subequal, spuriously 2-lobed, apex pointed and much inflexed. Styles erect rather short; stylopods depressed conical, crenulate at margin. Fruit[7] sub-elliptical, much compressed parallel to septum; margin rather thick aliform entire simple. Mericarps highly connate, not separable; margins contiguous only before maturity; carpophore 0. Dorsal and lateral dorsal ridges linear scarcely prominent. Vittæ 0. Seed much compressed, flat at face, in one cell oftener minute aborted.—Herbs nearly stemless; flowers radical pinnate, 1–2-ribbed; segments unequal rather broad crenate; the terminal[8] larger; flowers[9] in sparsely[10] compound or simple umbels subequal to

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[1] *Gen.* n. 345.—J. *Gen.* 222.—Koch, *Umb.* 89.—Lag. *Amœn.* ii. 92.—DC. *Prodr.* iv. 191.—Spach, *Suit. à Buffon*, viii. 170.—Endl. *Gen.* n. 4477.—Payer, *Organog.* 401, t. 88.—B. H. *Gen.* 921, n. 127 (part).—H. Bn. *Payer Fam. Nat.* 335.—Hook. *Fl. Ind.* ii. 711.—*Sphondylium* T. *Inst.* 319, t. 178.—Hoffm. *Umb.* 129.—*Barysoma* Bge. *Del. Sem. Hort. Dorpat.* (1839) ex *Linnæa*, xiv. *Litt.* 117.

[2] White or more rarely yellowish.

[3] Boiss. *Ann. Sc. Nat.* ser. 3, i. 344; *Fl. Or.* ii. 1051.

[4] DC. *Prodr.* iv. 199.

[5] Spec. 60–70. Reichb. *Ic. Fl. Germ.* t. 1969–1978.—Lædeb. *Ic. Fl. Ross.* t. 303, 304.—Guss. *Pl. Rar.* t. 27.—Jacq. *Fl. Austr.* t. 173–175.—Sibth. *Fl. Græc.* t. 282.—Fisch. ex *Ledeb. Fl. Ross.* ii. 326.—Fenzl, *Tchihatch. As. Min. Bot.* i. 436 (*Pastinaca*).—Dalz. *Hook. Kew Journ.* ii. 260.—Boiss. *Fl. Or.* ii. 1039.—Gren. et Godr. *Fl. de Fr.* i. 695.—Franch. et Sav. *Enum. Pl. Jap.* i. 189.—C. Gay, *Fl. Chil.* iii. 132.—A. Gray, *Man.* (ed. 5) 191.—Chapm. *Fl. S. Unit. St.* 165.—S. Wats. *King's Rep. Bot.* 131.—Walp. *Rep.* ii. 415, 939; v. 889; *Ann.* i. 353; ii. 711; v. 76.

[6] *Verz. Pfl. Cauc.* 127.—Boiss. *Fl. Or.* ii. 1063.

[7] In form nearly of *Heracleum.*

[8] Often single.

[9] White or purplish.

[10] Often 5–7-rayed.

leaves springing from the collum.[1] (*East Caucasus, Daghestan.*[2])

14. **Malabaila** Hoffm.[3]—Flowers[4] nearly of *Heracleum* (or *Peucedanum*); sepals conspicuous, small or 0. Fruit obovate or ellipsoid much compressed, with a more or less deep depression at apex, surrounding the (sometimes rather thick) conical stylopod (*Eumalabaila, Lefebvria,*[5] *Analyrium*[6]); the thickened margin separated from the cells by a subequal disk (*Lefebvria, Opopanax,*[7] *Stenotænia,*[8] *Tetratænia,*[9] or sometimes by a little thicker disk (*Eumalabaila, Zozimia*[10]), sometimes by a thin rather broad (*Eumalabaila*) or narrow (*Tetratænia, Zozimia*) space. Vittæ either solitary in furrow, dorsal 4 (*Zozinia, Tetratænia, Lefebvria*), rarely shorter than the mericarps (*Eumalabaila*), or more rarely (*Stenotænia, Opopanax*) 2, 3. Face of seed generally flat.—Perennial herbs, glabrous or oftener pubescent or hirsute; leaves pinnate or pinnately decompound or ternate; umbels compound; bracts of involucres and involucels ∞, thin or short, sometimes 0. (*South east. Europe, Levant, north. and warm east. Africa.*[11])

15 ? **Johrenia** DC.[12]—Flowers[13] nearly of *Peucedanum;* sepals 5, more or less conspicuous. Petals broad; point broad involute; sometimes (*Ducrosia*[14]) not radiating. Fruit thick ellipsoid; thick margin contiguous to cells; mericarps either oblong (*Eujohrenia*), or wider suborbiculate (*Ducrosia*); ridges thick suberose, but not more

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[1] Gen. very near to *Heracleum* and *Pastinaca* differing chiefly in the absence of vittæ and carpophore.

[2] Spec. 1. *S. graveolens* C. A. Mey.—B. H. *Gen.* 922 (*Heracleum* ?).—Walp. *Rep.* v. 889.

[3] *Umb.* (1814) 125 (not Tausch).—B. H. *Gen.* 923, n. 131.—H. Bn. *Adansonia,* xii. 169.—*Leiotulus* Ehrenb. *Linnæa,* iv. 399.—DC. *Prodr.* iv. 669.—Endl. *Gen.* n. 4494.—*Lophotænia* Griseb. *Spic. Fl. Rumel.* i. 377.

[4] Yellow or more rarely white.

[5] A. Rich. *Ann. Sc. Nat.* ser. 2, xiv. 260, t. 15 (1840); *Fl. Abyss.* i. 328, t. 55.—*Lefeburia* B. H. *Gen.* 921, n. 126.

[6] E. Mey. herb. — *Peucedanum millefolium* Sond. *Fl. Cap.* ii. 559, n. 17.

[7] Koch, *Umb.* 96 (1824).—DC. *Prodr.* iv. 170.—B. H. *Gen.* 122, n. 130.—*Opoponax* Endl. *Gen.* 922, n. 4458 (part).

[8] The type is *O. orientale* Boiss. *Ann. Sc. Nat.* ser. 3, i. 330; *Fl. Or.* ii. 1059.—*Pastinaca Opopanax* Sibth. *Fl. Græc.* t. 288 (not L.), referred by B. H. to *Malabaila.*

[9] Hoffm. *Umb.* 175, t. 4 (1814).—DC. *Prodr.* iv. 195 (part).—Endl. *Gen.* n. 4478 (part).—B. H. *Gen.* 924, n. 133.—Hook. *Fl. Ind.* ii. 717.

[10] Boiss. *Ann. Sc. Nat.* ser. 3, i. 339; *Fl. Or.* ii. 1052.

[11] Spec. 15, 16. Boiss. *Diagn. Or.* ser. 2, v. 100; vi. 84; *Fl. Or.* ii. 1037 (*Zozimia*), 1053, 1058 (*Opopanax*) —Sibth. *Fl. Græc.* t. 281, 282 (*Heracleum*).—Reichb. f. *Ic. Fl. Germ.* t. 1943 (*Opopanax*).—Gren. et Godr. *Fl. de Fr.* i. 693 (*Opopanax*).—Walp. *Rep.* ii. 425; v. 873 (*Opopanax*), 886, 891 (*Zozimia*); *Ann.* i. 353 (*Zozimia*); ii. 704 (*Opopanax*), 710, 712 (*Zozimia*).

[12] *Mém.* 54, t. 1; *Prodr.* iv. 196 (1830).—Endl. *Gen.* n. 4480.—B. H. *Gen.* i. 925, n. 135.

[13] White or yellowish.

[14] Boiss. *Ann. Sc. Nat.* ser. 3, i. 341 (1844).—B. H. *Gen.* 923, n. 132.

elevated than margin, often little prominent or scarcely perceptible. Vittæ in furrows solitary, the intrajugal also very thin often conspicuous. Seed flat. Carpophore 2-partite.—Perennial herbs, glabrous or more or less downy (*Ducrosia*); leaves generally subradical, pinnately or 3-nato-pinnately decompound; bracts of involucres few, often small, sometimes 0. (*Levant, Dahuria.*[1])

16. **Tordylium** T.[2]—Flowers[3] generally with unequal or subequal sepals, more rarely without sepals.[4] Petals generally radiating and unequal; the larger 2-lobed. Fruit oval-elliptical or oftener orbicular coin-shaped, much compressed; margin swollen to a ring thicker than the cells, entire before dehiscence, suberose (white), transversely plicato-rugose, rarely smooth. Mericarps dorsally flat or slightly convex; primary and dorsal intermediate ridges imperceptible or very thin; secondary sometimes (*Ormosciadium*[5]) also slightly prominent.[6] Vittæ in furrows solitary or 2-nate, more rarely ∞ (*Polytænia*,[7] *Condylocarpus*[8]). Seed very flat. Carpophore 2-partite.—Annual or more rarely perennial herbs, often woolly or hairy; leaves simple, pinnate or pinnately decompound; bracts of involucres or involucels ∞, various in form, sometimes linear-elongate, or more rarely 0. (*Europe, north. Africa, temp. west. and central Asia, north. America.*[9])

17. **Angelica** T.[10]—Flowers hermaphrodite or polygamous; sepals

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[1] Spec. about 10. Jaub. et Spach, *Ill. Pl. Or.* t. 238 (*Zozimia*).—Boiss. *Diagn. Or.* ser. 2, v. 99; vi. 80; *Fl. Or.* ii. 1010, 1036 (*Ducrosia*).—Walp. *Rep.* ii. 891 (*Ducrosia*), 892; *Ann.* i. 354; ii. 712.

[2] *Inst.* 320. t. 170.—L. *Gen.* n. 330.—DC. *Prodr.* iv. 197.—Endl. *Gen.* n. 4482.—B. H. *Gen.* 924, n. 134.

[3] White, yellow or purplish.

[4] E. g. *Ainsworthia* (Boiss. *Ann. Sc. Nat.* ser. 3, i. 343; *Diagn. Or.* ser. 2, v. 100; *Fl. Or.* ii. 1034). In other respects not separable generically from *Hasselquistia.*

[5] Boiss. *Ann. Sc. Nat.* ser. 3, ii. 95; *Fl. Or.* ii. 1029.—B. H. *Gen.* 925, n. 136.— *Hormosciadium* Endl. *Gen.* Suppl. iv. p. iii. 16.

[6] *Hasselquistia* (L. *Gen.* n. 341.—DC. *Prodr.* iv. 197.—Jacq. *Hort. Vindob.* t. 87, 193.—Koch, *Umb.* 88.—Endl. *Gen.* n. 4481). The fruits come out partly in different forms, especially the central; one mericarp being aborted, the other assumes a sub-spherical cup or flask shape. But the normal fruit is quite that of *Tordylium*; hence the autonomy of the genus is not to be accepted. In *Synelcosciadium* (Boiss. *Ann. Sc. Nat.* ser. 3, i. 345; *Fl. Or.* ii. 1050) as in *Hasselquistia*, the margins of the mericarps are less swollen, but the carpels, as in the true *Tordylia*, are complanate.

[7] DC. *Mém.* 53, t. 13; *Prodr.* iv. 196.—Lamk, *Ill.* t. 193.—Endl. *Gen.* n. 4479.—B. H. *Gen.* 922, n. 129.

[8] Hoffm. *Umb.* 202.

[9] Spec. 12-14. Sibth. *Fl. Græc.* t. 267.—Desf. *Fl. Atl.* t. 58.—Reichb. f. *Ic. Fl. Germ.* t. 1978-1980.—A. Gray, *Man.* (ed. 5) 191.—Jaub. et Spach, *Ill. Pl. Or.* t. 237.—Gren. et Godr. *Fl. de Fr.* i. 697.—Walp. *Rep.* ii. 447; v. 891 (*Synelcosciadium*), 894 (*Ainsworthia*), 895, 923 (*Ormosciadium*); *Ann.* ii. 713.

[10] *Inst.* 313, t. 167.—L. *Gen.* n. 347.—Hoffm. *Umb.* t. 158.—Koch, *Umb.* 99.—DC. *Prodr.* iv. 167 (part.).—Endl. *Gen.* n. 4456.—B. H. *Gen.* 916, n. 121.—H. Bn. *Adansonia*, xii. 176. Hook. *Fl. Ind.* ii. 706.—*Gingidium* Forst. *Char. Gen.* 41, t. 21.—*Ostericum* Hoffm. *Umb.* 162.—DC. *Prodr.* iv. 167.—*Gomphopetalum* Turcz. *Bull. Mosc.* (1841), 537.—*Callisace* Fisch. *Hoffm.*

minute or 0. Petals[1] entire or retuse. Stylopods depressed, marginally entire or undulate. Fruit longer or shorter ovoid, dorsally compressed; dorsal and intermediate ridges slightly prominent, not or very narrow winged; the lateral produced to rather thick (*Levisticum*[2]) or submembranous wings; margin double from early separation of wings; commissural face narrower. Vittæ in cells solitary (*Euangelica*, *Levisticum*), or ∞ (*Archangelica*[3]). Carpophore 2-partite. Seed dorsally compressed, face flat or slightly concave. Herbs oftener tall; leaves pinnately or ternately compound or decompound; laciniæ generally broad dentate; umbels compound, ∞-radiate; bracts of involucres ∞ (*Levisticum*), narrow, or few, sometimes 0; bracteoles of involucels setaceous or 0 (*Archangelica*, *Euangelica*), sometimes ∞ (*Levisticum*), connate at base. (*Europe, north. America, north. and arctic Asia, N. Zealand.*[4])

18. **Astydamia** DC.[5]—Flowers without or with very small calyx. Petals[6] oval, entire or retuse. Stylopods thick-conical, undulate at margin. Fruit elliptico-ovate compressed; commissure wide. Mericarps dorsally slightly convex; margins rather thick broad suberose separating by a furrow before dehiscence; dorsal and intermediate ridges very little prominent; vittæ broad solitary; carpophore 2-partite. Seed compressed, face flat or slightly concave.[7]—A glabrous perennial herb; stem sub-shrubby at base; leaves broad inciso-pinnate; segments cuneate incised; umbels compound; bracts of involucres and involucels ∞, rather short.[8] (*Canaries.*[9])

Umb. 170.—DC. *Prodr.* iv. 184.—*Eustylis* Hook. f. *Fl. N.-Zel.* t. 19.—*Angelophyllum* Rupr. *Rev. Umbell. Kamtch.* 8.

[1] White, yellowish, greenish or dark purple.

[2] Koch, *Umb.* 101, fig. 41.—DC. *Prodr.* iv. 164.—Endl. *Gen.* n. 4453.—B. H. *Gen.* 916, n. 120.

[3] Hoffm. *Umb.* 166.—DC. *Prodr.* iv. 169.—Spach, *Suit. à Buffon*, viii. 155.—Endl. *Gen.* n. 4457.—B. H. *Gen.* 917, n. 122.—Hook. *Fl. Ind.* ii. 707.—*Czernaevia* Turcz. *Fl. Baik.-Dahur.* i. 498; *Ledeb. Fl. Ross.* ii. 293.

4. Spec. 20-22. Reichb. f. *Ic. Fl. Germ.* t. 1936, 1937; 1940 (*Archangelica*), 1941 (*Levisticum*).—Ledeb. *Ic. Fl. Ross.* t. 166 (*Archangelica*).—F. Schm. *Maxim. Prim. Fl. Amur.* 127.—Boiss. *Diagn. Or.* ser. 2, ii. 87; *Fl. Or.* ii. 978.—Hook. f. *Fl. N.-Zel.* t. 19; *Man. N. Zeal. Fl.* 97.—Miq. *Ann. Mus. Lugd.-Bat.* iii. 61.—Fr. et Sav. *En. Jap.* i. 187.—Torr. *Fl. N. York*, t. 36 (*Archangelica*).—A. Gray, *Man.* (ed. 5), 192, 193 (*Archangelica*).—Chapm. *Fl. S. Unit. St.* 164.—S. Wats. *King's Rep. Bot.* 126, 127 (*Archangelica*).—Gren. et Godr. *Fl. de Fr.* i. 684.—Walp. *Rep.* ii. 406, 407 (*Archangelica*), 938; v. 873 (*Archangelica*); *Ann.* i. 349; v. 873; ii. 703; v. 73 (*Archangelica*).

[5] *Mém.* 53, t. 1, D; *Prodr.* iv. 190.—Endl., *Gen.* n. 4475.—B. H. *Gen.* 909, n. 103.—*Tenoria* Spreng. *Umb.* 20 (part).

[6] Said to be yellow.

[7] Embryo conspicuous, sub-equal to half the albumen; cotyledons oblong-lanceolate.

[8] Fruit nearly of *Peucedanum* from which it differs chiefly in the margins being sooner solute, a character of little moment. Its affinities moreover with *P.* (*Bubon*) *Galbanum* are great.

[9] Spec. 1. *A latifolia.*—*A. canariensis* DC.—Webb, *Phyt. Canar.* t. 76.—*Crithmum latifolium*

19. **Polemannia** Eckl. and Zeyh.[1]—Flowers[2] small; sepals conspicuous dentiform. Petals oblong; point inflexed entire. Stylopods conical. Fruit subovoid glabrous, slightly compressed at back; margin rather thick 1-toothed at apex.[3] Mericarps dorsally compressed, at base decurrent to pedicel; primary dorsal and intermediate ridges little prominent. Vittæ in furrows solitary. Face of seed nearly flat.—Glabrous shrubs;[4] leaves 3-fid or 3-nato-pinnate dissected; segments cuneate, 3-fid; umbels in more or less branched and leafless raceme; the lateral simple; the terminal compound; bracts and bracteoles subulate few or 0.[5] (*South Africa.*[6])

20. **Aciphylla** Forst.[7]—Flowers[8] hermaphrodite, oftener polygamo-dicœcious or monœcious; sepals conspicuous or 0. Petals entire, retuse or variously emarginate. Stylopods conical or depressed. Fruit oblong (*Anesorhiza*,[9] *Euaciphylla*), oval (*Cymopterus*[10]), or oval-oblong (*Thaspium*[11]); rarely obtuse or retuse (*Cymopterus*). Ridges rather prominent, or (all or part) more or less widely alate (*Thaspium*, *Cymopterus*); the sutural alate or exalate. Vittæ in furrows solitary (*Anesorhiza*, *Thaspium*) or ∞ (*Aciphylla* (part), *Cymopterus*). Seed at face concave (*Cymopterus*) or nearly flat (*Thaspium*, *Anesorhiza*), often sulcate at vittæ.—Perennial herbs, sometimes subcæspitose (*Cymopterus*); leaves ternately dissected (*Thaspium*), pinnate or pinnately decompound, sometimes reduced to simple petioles or to a few linear folioles; umbels compound often few-rayed; bracts of involucre and involucels ∞, or more rarely 0, entire or more rarely dissected.[12] (*South Africa*, *Australia*, *N. Zealand*, *N. America.*[13])

L. f. *Suppl.* 180.—*Laserpitium crithmifolium* Link.—*Tenoria canariensis* Spreng.—*Heracleum canariense* Chois.

[1] *Enum. Pl. Afr. Austr.* 347.—Endl. *Gen.* n. 4431.—B. H. *Gen.* 909, n. 104.

[2] Said to be white.

[3] Hence resembling that of *Todaroa*; but the primary ridges are conspicuous, not the secondary.

[4] Habit oftener peculiar, e. g. in *P. grossulariæfolia* (*Lepisma verticillatum* E. Mey.).

[5] Gen. scarcely autonomous, on the one hand, as to its fruit, compared with *Astydamia*, on the other hand hardly separable from *Aciphylla* and *Anesorhiza*.

[6] Spec. 2. Harv. and Sond. *Fl. Cap.* ii. 550.—Walp. *Rep.* ii. 403.

[7] *Char. Gen.* 135, t. 68.—B. H. *Gen.* 912, n. 114.—H. Bn. *Adansonia*, xii. 169.—*Calosciadium* Endl. *Gen.* n. 4442[2] (Suppl. iv. p. iii. 7).—*Anisotome* Hook. f. *Fl. Antarct.* i. 16, t. 8–10 (not Fenzl).—*Gingidium* F. Muell. *Trans. Phil. Inst. Viet.* i. 103 (not Forst.).

[8] White, yellow or purplish.

[9] Cham. et Schlchtl, *Linnæa*, i. 398 (*Anesorhiza*).—B. H. *Gen.* 913, n. 115.—*Glia* Sond. *Fl. Cap.* ii. 547.—*Stenosemis* E. Mey. ex Sond. *loc. cit.* 551.

[10] Rafin. *Journ. Phys.* lxxxix. 100.—DC. *Prodr.* iv. 203.—Endl. *Gen.* n. 4491.—B. H. *Gen.* 911, n. 111.

[11] Nutt. *Gen. Pl. Amer.* i. 196 (part).—DC. *Prodr.* iv. 153.—B. H. *Gen.* 913, n. 116.

[12] A genus closely allied to *Ligusticum* (i. e. *Meum*).

[13] Spec. about 30. Forst. *Fl. Austr.* 140 (*Ligusticum*).—L. f. *Suppl.* 181 (*Laserpitium*).—DC. *Prodr.* iv. 159, n. 18 (*Ligusticum*).—Hook. *Fl. Bor.-Amer.* t. 95 (*Selinum*); *Icon.* t. 607.—Torr. et Gr. *Fl. N.-Amer.* i. 623 (*Cymopterus*)

21. **Meum** T.[1]—Flowers[2] oftener hermaphrodite, rarely polygamous; sepals rarely conspicuous, generally 0. Petals rarely entire; apex more or less inflexed; or from costa impressed above emarginate, sometimes 2-lobed. Stylopods conical or oftener depressed. Fruit oval or oval-oblong, transversely subterete or dorsally more or less compressed; ridges all or dorsal raised, or produced to rather thick generally narrow, sometimes very narrow wings or almost 0 (*Silaus*,[3] *Bonannia*,[4] *Schultzia*,[5] *Trochiscanthes*[6]). Commissure broad. Vittæ in furrows 0 (*Silaus*), or solitary (*Pleurospermum*,[7] *Cortia*,[8] *Selinum*[9]), sometimes broad (*Siler*[10]), oftener ∞ (*Eumeum*, *Ligusticum*,[11] *Schultzia*,

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—Meissn. *Hook. Lond. Journ.* ii. 533 (*Seseli*).—Sond. *Fl. Cap.* ii. 544 (*Anesorhiza*), 549, n. 1 (*Seseli*).—Hook. f. *Handb. N.-Zeal. Fl.* 91, 93 (*Ligusticum*); *Fl. Tasm.* ii. 363 (*Gingidium*).—Hombr. et Jacquin. *Voy. Astr. Bot.* t. 3 (*Ligusticum*).—Benth. *Fl. Austral.* iii. 374.—F. Muell. *Fragm.* i. 15 (*Gingidium*).—A. Gray, *Man.* (ed. 5) 194 (*Thaspium*).—S. Wats. *King's Rep. Bot.* 125 (*Thaspium*).—Walp. *Rep.* ii. 400 (*Anesorhiza*); v. 868 (*Aciphylla*, *Anisotome*); *Ann.* ii. 702 (*Thaspium*); v. 71 (*Aciphylla*, *Anisotome*).

[1] *Inst.* 312, t. 165.—Jacq. *Fl. Austr.* iv. 2, t. 303.—Gærtn. *Fruct.* i. 106, t. 23.—Koch, *Umb.* 103.—DC. *Mém.* 49; *Prodr.* iv. 162.—Spach, *Suit. à Buff.* viii. 201.—Endl. *Gen.* n. 4445.—B. H. *Gen.* 911, n. 110.—H. Bn. *Adansonia*, xii. 171.

[2] Oftener white or yellowish.

[3] Bess. *Rœm. et Sch. Syst.* vi. 36.—Koch, *Umb.* 105.—DC. *Prodr.* iv. 161.—Endl. *Gen.* n. 4444.—B. H. *Gen.* 910, n. 107.

[4] Guss. *Fl. Sic. Syn.* i. 335.—B. H. *Gen.* 910, n. 106.—H. Bn. *Adansonia*, xii. 472; *Bull. Soc. Linn. Par.* 185.

[5] Spreng. *Umb. Prodr.* 30 (*Schulzia*); *Spec. Umb.* 102.—Sch. *Syst.* vi. 41.—DC. *Prodr.* iv. 112.—Endl. *Gen.* n. 4403.—B. H. *Gen.* 909, n. 105.—Hook. *Fl. Ind.* ii. 697.

[6] Koch, *Umb.* 103, fig. 95.—DC. *Prodr.* iv. 154.—Endl. *Gen.* n. 4439.—B. H. *Gen.* 910, n. 109.—*Podopetalum* Gaud. (ex DC.).

[7] Hoffm. *Umb. Præf.* 8. fig.—Koch, *Umb.* 134.—DC. *Prodr.* iv. 244.—Endl. *Gen.* n. 4536.—B. H. *Gen.* 915, n. 119.—Hook. *Fl. Ind.* ii. 702.—*Physospermum* Cuss. ex Vela et Lag. *Amœn. Nat. Matrit.* ii. 75, 97 (not of others).—*Enymonospermum* Spreng. (ex DC.).—*Hymenolæna* DC. *Prodr.* iv. 244.—*Hladnikia* Koch, *Syn. Fl. Germ.* 320 (not Reichb.).—*Malabaila* Tausch, *Flora* (1834), 356 (not Hoffm.). — *Aulacospermum* Ledeb. *Fl. Alt.* iv. 344; *Icon. Fl. Ross.* t. 311, 312.—*Hymenidium* Lindl. *Royl. Ill.* 233.—Kl. *Wald. Reis. Bot.* t. 48.—*Pterocyclus* Kl. *loc. cit.* t. 47.

[8] DC. *Prodr.* iv. 186.—Endl. *Gen.* n. 4468.—B. H. *Gen.* 915, n. 118.—Hook. *Fl. Ind.* ii. 701.

[9] L. *Gen.* n. 337.—Hoffm. *Umb.* i. 105.—Koch, *Umb.* 100, fig. 22, 23.—DC. *Prodr.* iv. 165.—Endl. *Gen.* n. 4454.—B. H. *Gen.* 914, n. 117.—*Carvifolia* L.—Vaill.—Jacq. *Fl. Austr.* t. 16.—*Thysselinum* Adans. *Fam.* ii. 100 (ex DC.).—*Cnidium* Cuss. *Mém. Soc. Méd. Par.* (1782) 280.—Hoffm. *Umb.* i. 157.—Koch, *Umb.* 108, fig. 48.—DC. *Prodr.* iv. 152.—Endl. *Gen.* n. 4436.—B. H. *Gen.* 914, n. 117.—*Cenolophium* Koch, *DC. Prodr.* iv. 151; *Mém.* 48, t. 3.—*Heteroptylis* E. Mey. ex Meissn. *Hook. Lond. Journ.* ii. 534.—*Oreocome* Edgew. *Trans. Linn. Soc.* xx. 54.—*Anthosciadium* Fenzl. *Endl. Gen.* Suppl. iv. p. iii. 9.—*Lithosciadium* Turcz. *Fl. Baic.-Dahur.* i. 489.—*Sphenosciadium* A. Gray, *Proc. Amer. Acad.* vi. 536 (wings narrowed at base).—*Tilingia* Reg. *Nouv. Mém. Soc. Nat. Mosc.* xi. 97.

[10] Scop. *Fl. Carniol.* i. 217 (not Mœnch).—Gærtn. *Fruct.* i. 92, t. 21.—Koch, *Umb.* 84.—DC. *Prodr.* iv. 200.—Endl. *Gen.* n. 4485.—B. H. *Gen.* 908, n. 102.—*Bradlæia* Neck. *Elem.* n. 280.—*Agasyllis* Hoffm. *Umb.* 176.—Spreng. *Umb.* 22.—DC. *Prodr.* iv. 199.—Endl. *Gen.* n. 4484.—Hook. *Fl. Ind.* ii. 699.

[11] T. *Inst.* 323, t. 171.—L. *Gen.* n. 346 (part).—Koch, *Umb.* 104.—DC. *Prodr.* iv. 157 (part).—Endl. *Gen.* n. 4442 (part).—B. H. *Gen.* 911, n. 112.—Hook. *Fl. Ind.* ii. 698.—*Coristospermum* Bertol. *Fl. Ital.* iii. 446.—*Pachypleurum* Ledeb. *Fl. Alt.* i. 296; *Ic. Fl. Ross.* t. 344.—*Gaya* Gaud. *Fl. Helv.* ii. 389.—DC. *Prodr.* iv. 163.—*Endressia* J. Gay, *Ann. Sc. Nat.* ser. 1, xxvi. 223.—*Neogaya* Meissn. *Gen.* 144; *Comm.* 104.—*Conioselinum* Fisch. *Hoffm. Umb.* 185.—DC. *Prodr.* iv. 163.—*Haloscias* Fries. *Summ. Veg. Scand.* 180.—*Hansenia* Turcz. *Fl. Baic.-Dahur.* i. 513.—*Cynapium* Nutt. *Torr. et Gr. Fl. N.-Am.* i. 640.—Endl. *Gen.* n. 4543[7].

Trochiscanthes, *Cyathoselinum*[1]), sometimes thin or obscure (*Ligusticum* (part), *Bonannia*, *Pachypleurum*). Intrajugal vittæ sometimes thin (*Selinum*, *Lomatocarum*[2]). Carpophore 2-partite. Seed dorsally rather compressed or semilunate, face nearly flat or slightly concave.[3]—Perennial herbs, oftener glabrous; leaves pinnately or ternato-pinnately decompound, sometimes 2–3-pinnate (*Bonannia*); umbels compound; involucral bracts ∞, few or subnil (*Silaus*), sometimes lobed (*Cortia*); bracteoles of involucels ∞, narrow or broadly membranous translucent (*Hyalolæna*[4]), sometimes foliaceous, dissected (*Schultzia*) or more rarely (*Cyathoselinum*) connate in cupule. Umbels sometimes (*Trochiscanthes*) in a leafless verticillately branched raceme, compound, small. (*All temp. regions of north. hemisphere.*[5])

22. **Albertia** Rgl. and Schmalh.[6]—A new genus said to be allied to *Pleurospermum* and *Aulacospermum*.

23 ? **Polyzygus** Dalz.[7]—Flowers[8] small; sepals minute, unequal or subequal. Petals oblong, retuse or emarginate. Stylopods depressed conical. Styles elongate straight,[9] at apex stigmatose capitellate. Fruit[10] ovoid; commissure broad; mericarps semiterete or scarcely compressed at back; primary ridges little prominent. Vittæ in furrows 1–3. Carpophore 2-partite. Face of seed flat.—Glabrous herbs,[11] with subterranean tubers[12] at base; leaves decompound 3-nately pinnate; umbels compound; involucral bracts few or 0; bracteoles of involucels few linear small unequal setaceous. (*E. India.*[13])

[1] Benth. *Gen.* 912, n. 113.—H. Bn. *Adansonia*, xii. 174.

[2] Fisch. et Mey. *Ind. Sem. Hort. Petrop.* vi. 59.—Endl. *Gen.* n. 4406 [1].

[3] Sometimes in the same species.

[4] Bge. *Rel. Lehm. Mém. Sav. Étr. Acad. S.-Pétersb.* vii. 304.

[5] Spec. about 70. Jacq. *Fl. Austr.* t. 151 (*Ligusticum*); *Hort. Vindob.* iii. t. 38 (*Laserpitium*).—Torr. et Gr. *Fl. N.-Am.* i. 619 (*Conioselinum*).—Torr. *Fl. New York*, t. 35 (*Conioselinum*).—Desf. *Fl. Atl.* t. 71 (*Laserpitium*).—Guss. *Prodr. Fl. Sic.* i. 335 (*Ligusticum*); *Pl. Rar.* 130, t. 26.—Ledeb. *Ic. Fl. Ross.* t. 81 (*Athamantha*).—Lindl. *Royl. Ill.* 233 (*Laserpitium*).—Royle, *Ill.* t. 52 (*Hymenolæna*).—Wall. *Cat.* n. 582 (*Angelica*), 584 (*Laserpitium*).—Miq. *Pl. Hohen.* n. 657 (*Pimpinella*).—Turcz. *Fl. Baic.-Dahur.* i. 93 (*Stenocœlium*).—Reichb. f. *Icon. Fl. Germ.* t. 1914 (*Seseli*), 1918 (*Trochiscanthes*), 1919 (*Conioselinum*), 1920 (*Cenolophium*), 1921, 1922 (*Cnidium*), 1928 (*Pachypleurum*), 1932, 1933; 1984 (*Siler*).—Miq. *Ann. Mus. Lugd.-Bat.* iii. 60 (*Cnidium*, *Ligusticum*).—A. Gray, *Man.* (ed. 5) 194 (*Ligusticum*).—Wats. *King's Rep. Bot.* 125 (*Ligusticum*), 126 (*Selinum*).—Gren. et Godr. *Fl. de Fr.* i. 699 (*Gaya*), 700 (*Endressia*, *Meum*), 701 (*Silaus*), 702 (*Ligusticum*), 704 (*Trochiscanthes*), 705 (*Cnidium*).—Walp. *Rep.* ii. 403 (*Cnidium*), 404 (*Ligusticum*, *Silaus*), 405 (*Endressia*, *Neogaya*, *Conioselinum*), 406 (*Selinum*); v. 850 (*Schultzia*), 852 (*Lomatocarum*), 870 (*Neogaya*, *Conioselinum*), 871 (*Pachypleurum*); *Ann.* ii. 703; v. 70 (*Ligusticum*), 72 (*Silaus*, *Pachypleurum*).

[6] *Rgl. Pl. Nov.* fasc. vi. 29.

[7] *Hook. Kew Journ.* ii. 260.—B. H. *Gen.* 910, n. 108.—Hook. *Fl. Ind.* ii. 697.

[8] "White."

[9] Often finally recurved.

[10] Nearly of *Ligusticum*, shorter but not unlike that of *Æthusa*, glabrous, at full maturity not known and vittæ hitherto imperfectly seen. A genus hence somewhat doubtful.

[11] Appearance of some *Pimpinellæ*.

[12] Rhizome (?) or root (?).

[13] Spec. 1. *P. tuberosus* Walp. *Ann.* ii. 714 (after *Agasyllis*).

24. **Capnophyllum** Gærtn.[1]—Flowers small; sepals small or 0. Petals [2] emarginate; point long evolved. Stylopods depressed conical, entire or undulate at margin. Fruit oval or oval-oblong, dorsally little or more compressed (*Krubera* [3]); margin somewhat or much (*Krubera*) thickened, more or less plicately rugose or tuberculate. Primary dorsal and intermediate ridges slightly prominent, entire or more or less tuberculate. Vittæ in furrows solitary, intrajugal and sometimes very thin. Carpophore 2-partite. Seed compressed, face flat.—Glabrous generally loosely branched annuals; leaves ternately pinnate decompound; umbels compound; bracts of involucre and involucels small; margin often membranous. (*Mediter. region, Canaries, south Africa.*[4])

25. **Diplotænia** Boiss.[5]—Flowers [6] polygamous; sepals acute, persistent. Petals emarginately inflexed. Stylopods conical. Fruit oblong-elliptical, immarginate, transversely subterete, somewhat compressed dorsally. Ridges subequal rather prominent, traversed by a superficial vitta (or 0). Furrows 1-vittate or the exterior sometimes 2–3-vittate. Seed much compressed, incurved, externally convex internally rather concave.—Tall herbs; leaves and inflorescence of *Ferula*.[7] (*Mount. Persia.*)

26. **Cymbocarpum** DC.[8]—Flowers subasepalous; petals obovate emarginate. Stylopods minute conical. Fruit glabrous, short ovoid, slightly compressed dorsally; margin before dehiscence entire thin; carpels convex at back, concave at face; carpophore 2-partite. Primary ridges very thin, scarcely visible; the lateral bordering fruit. Vittæ in furrows solitary thin. Seed conformed to mericarp, very concave within, convex at back; albumen lamiform.—Glabrous branched

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[1] *Fruct.* ii. 32, t. 85.—DC. *Prodr.* iv. 187.—Endl. *Gen.* n. 4470.—B. H. *Gen.* 908, n. 101.—*Actinocladus* E. Mey. *Ind. Sem. Hort. Reg.* (1846).

[2] White.

[3] Hoffm. *Umb.* 103.—DC. *Prodr.* iv. 199.—Endl. *Gen.* n. 4450.—*Ulospermum* Link, *Enum. Hort. Berol.* i. 267.

[4] Spec. 2. L. *Mantiss.* 352 (*Conium*).—Jacq. *Hort. Vindob.* t. 194 (*Conium*).—Desf. *Fl. Atl.* t. 66 (*Conium*).—Lag. *Gen. et Sp. Pl. Nov.* 13.—Sond. *Fl. Cap.* ii. 562.—Walp. *Ann.* i. 356 (*Actinocladus*).

[5] *Ann. Sc. Nat.* ser. 3, i. 308; *Fl. Or.* ii. 981. H. Bn. *Adansonia*, xii. 169. — *Pleurotænia* Hohen. exs. *Kotsch.* (ex B. H. *Gen.* 920).

[6] "White."

[7] Gen. referred by some (B. H.) to *Peucedanum;* it differs chiefly in its subterete immarginate fruit and semiterete mericarps, resembling those of *Ligusticum*, but rather longer, as in *Fœniculum*. A section of this genus perhaps will be *Crenosciadium siiflorum* Boiss. (*Diagn. Or.* ser. 1, x. 30; *Fl. Or.* ii. 981), a Lycaonic herb with habit of *Heracleum pumilum*, doubtfully referred (B. H.) to *Opopanax*, but approaching rather to *Peucedanum*, the fruit however is scarcely marginate (as in *Diplotænia*) and much less compressed than in *Peucedanum* and *Ferula*. Furrows 2–4-vittate.

[8] *Prodr.* iv. 186 (*Anethi* sect. dub.).—F. A. Mey. *Verz. Pfl. Cauc.* 132.—Endl. *Gen.* n. 4545.—B. H. *Gen.* 907, n. 99.

annuals;[1] leaves pinnately dissected; laciniæ generally narrow and short; rays of compound umbels ∞; bracts of involucre and involucels ∞, linear, more rarely in involucre broader foliaceous and dissected.[2] (*Levant.*[3])

27. **Œnanthe** T.[4]—Flowers hermaphrodite or polygamous; sepals generally acute, finally somewhat rigid or more rarely (*Dasyloma*,[5] *Phellandrium*,[6] *Crantzia*[7]) more slender, not accrescent, more rarely deciduous. Petals emarginate, 2-lobed or more rarely entire (*Cynosciadium*[8]). Stylopods short or oftener long-conical, sometimes depressed (*Crantzia*), at base entire or undulate. Fruit obovoid, transversely subterete or rather compressed at back (*Eurytænia*[9]). All ridges obtuse suberose (*Euœnanthe*,[10] *Phellandrium*, *Cynosciadium*) or slightly prominent (*Sclerosciadium*[11]); the lateral sometimes thicker (*Crantzia*) or 3-angular very thick (*Discopleura*[12]), sometimes broader aliform (*Daucosma*[13]) or approximate (*Eurytænia*); the dorsal sometimes more acute; the intermediate linear (*Eurytænia*). Carpophore 0, or scarcely visible (*Euœnanthe*, *Crantzia*), sometimes 2-fid or 2-partite (*Cynosciadium*, *Discopleura*, *Eurytænia*), more rarely simple or duplex (*Sclerosciadium*). Vittæ in furrows solitary, sometimes also intrajugal very thin. Face of seed generally flat.—Glabrous often aquatic herbs; leaves pinnate or pinnately compound, sometimes digitately (*Cynosciadium*) or ternately decompound, rarely reduced to linear or terete transversely nodose-septate petiole (*Crantzia*); umbels[14] simple (*Crantzia*), or oftener compound; bracts of involucres and involucels small or linear, sometimes 3–5-sect (*Eurytænia*, *Discopleura*), often few or 0; rays of sterile flowers sometimes (*Actinanthus*[15]) indurate or spinescent and coalescing with fruit. (*Temp. regions of both worlds.*[16])

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[1] Goatlike odour.

[2] A genus hence allied to *Peucedanum* sect. *Anethum*, thence to *Discopleura*, by its rather short fruit and the concavity of its mericarps somewhat resembling *Coriandrum sativum* and allied species.

[3] Spec. 4, ex Boiss. *Fl. Or.* ii. 1027.—Walp. *Rep.* ii. 427.

[4] *Inst.* 312, t. 166.—L. *Gen.* n. 352.—J. *Gen.* 221.—Lamk. *Dict.* iv. 526; *Ill.* t. 203.—Koch, *Umb.* 112.—DC. *Prodr.* iv. 136.—Spach, *Suit. à Buff.* viii. 205.—Endl. *Gen.* n. 4418.—B. H. *Gen.* 905.—H. Bn. *Adansonia*, xii. 174.—Hook. *Fl. Ind.* ii. 695.

[5] DC. *Prodr.* iv. 140.—*Cyssopetalum* Turcz. *Bull. Mosc.* (1849) ii. 25.

[6] T. *Inst.* 306, t. 161.—L. *Gen.* n. 353.

[7] Nutt. *Gen.* i. 177.—DC. *Prodr.* iv. 70; *Mém.* 27.—Endl. *Gen.* n. 4356.—B. H. *Gen.* 906, n. 14.

[8] DC. *Mém.* 44, t. 11; *Prodr.* iv. 140.—Endl. *Gen.* n. 4423.—B. H. *Gen.* 906, n. 95.

[9] Torr. et Gr. *Fl. N.-Amer.* i. 633.—Endl. *Gen.* n. 4479[1] (Suppl. i. 1414).—B. H. *Gen.* 907, n. 97.

[10] B. H. *Gen.* 906, 1.

[11] Koch, *DC. Prodr.* iv. 140; *Mém.* 43, t. 1.—B. H. *Gen.* 1009, n. 101.

[12] DC. *Mém.* 38, t. 8, 9; *Prodr.* iv. 106.—Endl. *Gen.* n. 4398.—B. H. *Gen.* 906, n. 96.—*Ptilimnium* Rafin. *Ser. Bull. Bot.* 217.

[13] Engelm. et Gr. *Pl. Lindheim. Bost. Journ. Nat. Hist.* vi. 210.

[14] Flowers oftener white, sometimes yellow.

[15] Ehrenb. *Linnæa*, iv. 398.—B. H. *Gen.* 903, n. 85.

[16] Reichb. f. *Ic. Fl. Ger.* t. 1860 (*Discopleura*).

28 **Æthusa** L.[1]—Flowers[2] (nearly of *Œnanthe*) asepalous; petals broad inflexed at apex and from depressed costa emarginate, spuriously 2-lobed, reduplicate-valved. Stylopods depressed. Fruit shortly ovoid, transversely subterete; carpels rather compressed at back. Ridges very prominent thick, transversely 3-angular, suberose (white), sometimes subcarinate. Vittæ in furrows solitary, intrajugal very thin or 0. Face of seed nearly flat. Carpophore 2-partite.—Glabrous annuals;[3] leaves decompound, 3-nately pinnate; umbels compound, or terminal, or oppositifolious; involucral bracts 0, or 1, short; bracteoles of involucels 1–5,[4] setaceous, inserted externally at side of inflorescence and descending.[5] (*Europe, north. Asia.*[6])

29. **Crithmum** T.[7]—Flowers subasepalous; petals[8] broad incurved;[9] point long induplicate.[10] Stamens 5; filaments at first incurved; anthers cordate; cells separated below by a short fold. Stylopods depressed conical; styles very short. Fruit ovoid-oblong; commissure broad; margins contiguous; exocarp thick suberose[11] everywhere equal; vittæ ∞,[12] linear with thin endocarp adnate to seed and with it separable from exocarp. Mericarps slightly compressed parallel to septum, 5-gonal; primary ridges subequal rather prominent, 3-angular. Seed rather compressed, face flat.—A glabrous branched perennial herb, shrubby at base; leaves fleshy ternato-pinnately decompound; laciniæ entire acute thick; umbels decompound; bracts of involucre foliaceous;[13] bracteoles of involucels few flat;[14]

1892–1898.—Jacq. *Hort. Vindob.* iii. t. 62.—Bory, *Exp. Morée*, t. 9.—Wight, *Icon.* t. 568 (*Dasyloma*), 571.—Wall. *Cat.* n. 7209 (*Ammi*).—Benth. *Fl. Austral.* iii. 374 (*Crantzia*).—Hook. f. *Fl. Antarct.* t. 100 (*Crantzia*); *Handb. N. Zeal. Fl.* 89 (*Crantzia*).—Wedd. *Chlor. Andina.* ii. t. 68 (*Crantzia*).—Schousb. *Beob. Mar.* 120.—Miq. *Ann. Musc. Lugd.-Bat.* iii. 59 (*Dasyloma*).—Clos. *C. Gay Fl. Chil.* iii. 126 (*Crantzia*).—A. Gray, *Man.* (ed. 5) 190 (*Crantzia*).—Chapm. *Fl. S. Unit. St.* 159 (*Crantzia*), 162 (*Discopleura*).—Torr. *Marc. Expl. Red Riv. Louis.* 287, t. 7 (*Eurytænia*).—Boiss. *Diagn. Or.* ser. 2, vi. 79; *Fl. Or.* ii. 955.—Harv. and Sond. *Fl. Cap.* ii. 547.—Gren. et Godr. *Fl. de Fr.* i. 713.—Walp. *Rep.* ii. 384 (*Crantzia*), 399, 401 (*Dasyloma*); v. 863; *Ann.* i. 347; iii. 898; v. 68.

[1] *Gen.* n. 355 (part).—Hoffm. *Umb.* 95, t. 1, fig. 5.—Spreng. *Umb.* 17.—Koch, *Umb.* 111.—DC. *Prodr.* iv. 141.—Endl. *Gen.* n. 4424.—B. H. *Gen.* 907, n. 98.

[2] White.

[3] With fœtid odour.

[4] Generally 3 conspicuous.

[5] Gen. certainly very near to *Œnanthe*.

[6] 1 spec. *Æ. cynapium* L. spread throughout the world. (See p. 183, note 5.)

[7] *Inst.* 317, t. 169.—L. *Gen.* n. 340 (part).—Koch, *Umb.* 102.—DC. *Prodr.* iv. 164.—Spach, *Suit. à Buffon*, viii. 215.—Endl. *Gen.* n. 4449.—B. H. *Gen.* 905, n. 92.

[8] Green or yellowish.

[9] Interior costa rather prominent and separating cells of alternate anthers.

[10] Concerning valvate prefloration of petals see Seemann (*Journ. Bot.* ii. 5) referring *Crithmum* to the *Hederaceæ* on account of its æstivation; a genus, however, differing widely from the *Araliecæ* especially in habit, leaves, and inflorescence.

[11] Resembling dry medulla.

[12] Transversely septate subarticulate.

[13] Often to 8.

[14] Often 6, 3-angular-elongate.

pedicels articulate under flower. (*Regions of Mediterr. and Black seas, west. Europe and north-west. shores of Africa.*[1])

30. **Glehnia** F. SCHMIDT.[2]—Flowers polygamous, very villose; sepals rather long subulate unequal.[3] Petals sublanceolate, inflexed at pointed apex, unequal. Stylopods thick-conical. Stamens 5; filaments finally very long; anthers oval. Fruit (nearly of *Crithmus*) subovoid; commissure broad; mericarps somewhat compressed parallel to septum. Primary ridges 5, produced to hard prismatic thickly suberose wings; the marginal sub-equal to the others. Vittæ ∞,[4] deep, thin, finally separating with seed from exocarp. Seed curved broadly concave at face. Carpophore slender, 2-partite. —A very villose herb;[5] leaves twice or thrice pinnately or ternately dissected; segments rather broadly obovate incised or dentate; flowers in compound umbels; involucral bracts few or 0; bracteoles of involucels ∞, acute. (*South east. cont. and ins. China, Japan shores.*[6])

31. **Pappea** HARV. and SOND.[7]—Flowers[8] minute; sepals short, sometimes rather broad, often unequal. Petals inflexed, induplicate-valvate. Stylopods depressed-conical, undulate at margin. Fruit[9] elliptic-oval, dorsally much compressed hirsute. Mericarps flat, margins rather thick, with broad orbicular vesicles filled with oleo-resin, more conspicuous on the face. Seed flat; embryo . . . ?—Low[10] prostrate much-branched herbs; leaves small dissected; umbels compound; bracts of involucre and involucels few foliaceous dissected. (*South Africa.*[11])

32. **Thecocarpus** BOISS.[12]—Flowers[13] polygamous; sepals dentiform, often persistent. Petals obovate, emarginate from inflexed apex. Stylopods conical. Fruit oblong ovoid or subconical, transversely subterete; carpels hard subligneous not separable. Primary

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[1] Spec. 1. *C. maritimum.* (See p. 194, note 10.)

[2] *Fl. Sanchal. Ined.* ex MIQ. *Ann. Musc. Lugd.-Bat.* iv. 61 (about 1867).—*Phellopterus* BENTH. *Gen.* 905, n. 90 (Oct. 1867).

[3] The anterior larger.

[4] Sometimes 2-fid above.

[5] With the habit of some *Heraclea* but generally much more villose.

[6] Spec. 1. *G. littoralis* F. SCHM.—*Cymopterus*? *littoralis* A. GRAY, *Bot. Jap. Mem. Amer. Acad.* vi. 391; *Stev. Pacif. Raylr. Exp. Rep.* (ex MIQ.).—*Archangelica officinalis* HOFFM. *Perr. Exp.* 312 (ex MIQ.).—*Phellopterus littoralis* BENTH.—FR. et SAV. *Enum. Pl. Jap.* i. 185.

[7] *Fl. Cap.* ii. 562 (not ECKL. et ZEYH.).—*Choritænia* BENTH. *Gen.* 907, n. 100.

[8] Whitish.

[9] Not quite ripe.

[10] With the habit of some *Fumariæ* or *Senebieræ*.

[11] Spec. 1. *P. capensis* SOND.—*Choritænia capensis* BENTH. *Hook. Icon.* ser. 3, 24, t. 1231.

[12] *Ann. Sc. Nat.* ser. 3, ii. 93; *Fl. Or.* ii. 954. —B. H. *Gen.* 903, n. 84.

[13] White.

ridges scarcely perceptible; vittæ obscure or 0. Seed rather compressed at back, flat or rather concave at face.—A glabrous rigid perennial herb; leaves pinnately compound; segments dissected; umbels compound; bracts of involucre and involucels small or 0; fruit surrounded by exterior sterile flowers and concrete with them hardened and with the pedicels and the bracts of the involucel.[1] (*Levant.*[2])

33. **Cachrys** T.[3]—Flowers[4] hermaphrodite or often polygamous; sepals minute or oftener 0. Petals emarginate, retuse or entire. Stylopods conical or depressed, entire or undulate at margin. Fruit ovoid or oblong, subterete or rather compressed dorsally, more rarely laterally (*Hippomarathrum*,[5] *Lecokia*[6]), either exalate (*Eucachrys*, *Magydaris*[7]), or all or some of the primary ridges expanded in wings (*Prangos*[8]). Ridges sometimes produced to a wing below mericarps (*Colladonia*[9]). Mesocarp thick fleshy, generally suberose or spongy and longitudinally divided within into as many thick segments as there are ridges; epicarp smooth or muricate (*Lecokia*), or tomentose (*Magydaris*). Carpophore 2-fid or 2-partite. Vittæ ∞, sometimes irregular and interrupted. Seed at face widely and deeply hollowed; margins involute.—Perennial herbs; leaves pinnately and ternately compound or oftener decompound; segments wide dentate lobed or oftener filiform, sometimes rigid and sharp pointed (*Hippomarathrum*); umbels compound; bracts of involucres and involucels ∞, linear-lanceolate or setaceous, more rarely short or 0. (*Meditt. region, west. and middle Asia.*[10])

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[1] Hence resembling those of *Excacantha* and *Echinophora* if not *Œnanthe prolifera*.

[2] Spec. 1. *T. meifolius* Boiss. *l. c. cit.*

[3] *Inst.* 325, t. 172.—L. *Gen.* n. 342.—J. *Gen.* 223.—Link. *Enum. Hort. Ber.* i. 271.—Koch, *Umb.* 136.—Hoffm. *Umb.* t. 3.—DC. *Prodr.* iv. 236.—Endl. *Gen.* n. 4525.—B. H. *Gen.* 904, n. 88.—H. Bn. *Adansonia*, xii. 177.

[4] Generally yellowish.

[5] Link, *Enum. Hort. Berol.* i. 271 (not Schur).—B. H. *Gen.* 883, n. 33 (part).—*Ægomarathrum* Koch, ex Meissn. *Gen.* 150 (108).—*Trachymarathrum* Tausch. *Flora* (1834), 344.—*Lophocachrys* Bertol. *Fl. Ital.* iii. 455.

[6] DC. *Mém.* 67, t. 2; *Prodr.* iv. 240.—Endl. *Gen.* n. 4528.—B. H. *Gen.* 882, n. 32.

[7] Koch, ex DC. *Mém.* 68; *Prodr.* iv. 241.—Endl. *Gen.* n. 4529.—B. H. *Gen.* 904, n. 87.

[8] Lindl. *Quart. Journ. Sc.* (1824) 7.—Lag. *Oc. Esp. Emigr.* (1826) 15.—DC. *Prodr.* iv. 239; *Mém.* 67.—Endl. *Gen.* n. 4526.—B. H. *Gen.* 904, n. 89.—Hook. *Fl. Ind.* ii. 695.—*Pteromarathrum* Koch (ex DC. *loc. cit.*).

[9] DC. *Prodr.* iv. 240.—Endl. *Gen.* n. 4527.—*Perlebia* DC. *Mém.* 67 (not Mart.).—*Meliocarpus* Boiss. *Ann. Sc. Nat.* ser. 3, ii. 84.—*Anisopleura* Fenzl. *Endl. Gen.* Suppl. iii. 82; iv. p. iii. 14.—*Heptaptera* Marg. et Reut. *Mém. Soc. Phys. Genève*, viii. 302, t. 5.

[10] Spec. about 40. Vent. *Jard. Cels.* t. 97 (*Laserpitium*).—Leder. *Ic. Fl. Ross.* t. 313.—Wall. *Pl. As. Rar.* t. 212 (*Prangos*).—Sibth. *Fl. Græc.* t. 278.—Boiss. *Fl. Or.* ii. 931 (*Lecokia*, *Hippomarathrum*), 935; 937 (*Prangos*), 944 (*Colladonia*).—Walp. *Rep.* ii. 424, 425 (*Heptaptera*); v. 914, 915 (*Prangos*), 918 (*Meliocarpus*), 919 (*Colladonia*, *Heptaptera*); *Ann.* ii. 720, 721 (*Prangos*), 722 (*Meliocarpus*); v. 79 (*Acanthopleura*), 80 (*Prangos*).

34. **Fœniculum** ADANS.[1] — Flowers [2] hermaphrodite or polygamous, asepalous. Petals entire, involute at apex. Stylopods thickly conical entire. Fruit oblong; commissure broad. Mericarps semiterete; ridges thick rather prominent equal or unequal. Vittæ solitary, sometimes the intrajugal very thin. Carpophore 2-partite. Face of seed flat or slightly concave.[3]—Glabrous perennial or biennial herbs; leaves decompound; laciniæ linear or filiform; umbels compound, ebracteate and ebracteolate.[4] (*Temp. regions of Old World.*[5])

35. **Physostrichia** HIERN.[6]—"Teeth of calyx acute subelongate-subulate, somewhat unequal, rather erect, in fruit little if at all enlarged, persistent. Petals obcordate, spuriously 2-lobed, on account of inflexed lacinule 1-nerved, not rayed (white glabrous). Stylopods thick sublobulate; stigmas large dark purple. Fruit ellipsoid-oblong subterete, commissure wide; carpels subplane at face; primary ridges prominent obtuse subequal, covered with dense cylindrical vesiculately inflated papillæ; secondary ridges 0; vittæ in furrows solitary (or in lateral furrows 2-nate ?). Carpophore 2-partite. Seed concave at face.—A subglabrous erect rigid perennial herb; leaves radical rather hard, 3-nately or pinnately compound; folioles oval or ovate; simple or sublobate, or 3-foliolate; umbels compound many-rayed; bracts of involucre and involucels ∞, submembranous." [7]

36. **Seseli** L.[8]—Flowers [9] generally hermaphrodite; sepals often acute small or 0. Petals equal or slightly unequal, entire (*Wallrothia* [10]), subentire, retuse, emarginate or spuriously 2-lobed. Stylopods high or depressed conical, entire or undulate at margin. Fruit ovoid-oblong, erostrate or shortly rostrate, glabrous, tomentose or hirsute, transversely subterete or slightly compressed at back. Primary ridges short exalate subequal, sometimes raised; lateral

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[1] *Fam. des Pl.* ii. 101.—GÆRTN. *Fruct.* i. 105, t. 23.—HOFFM. *Umb.* 120, t. 1.—LAG. *Amœn.* ii. 99.—KOCH, *Umb.* 112.—DC. *Prodr.* iv. 142.—SPACH, *Suit. à Buffon*, viii. 203.—ENDL. *Gen.* n. 4425.—B. H. *Gen.* 902, n. 81.—HOOK. *Fl. Ind.* ii. 695.—*Gasparinia* BERTOL. *Fl. Ital.* iii. 614.—*Ozodia* WIGHT and ARN. *Prodr.* 375.

[2] Yellow or greenish.

[3] Longitudinally sulcate.

[4] Flowers subarticulate under germen.

[5] Spec. 2, 3 (?). REICHB. F. *Ic. Fl. Germ.* t. 1930, 1931.—WIGHT, *Icon.* t. 570.—C. GAY, *Fl. Chil.* iii. 127.—MIQ. *Ann. Mus. Lugd.-Bat.* iii. 59.—BOISS. *Fl. Or.* ii. 975.—GREN. et GODR. *Fl. de Fl.* i. 712.—WALP. *Rep.* ii. 401, 938: v. 864.

[6] *Journ. Bot.* (1873) 161, t. 132.

[7] 1 Angola spec. *P. Welwitschii* OLIV. allied apparently to *Seseli* and to *Diplolophium*, not enumerated among the Umbelliferæ in the *Flora of Trop. Africa.*

[8] *Gen.* n. 360.—DC. *Mém.* 46; *Prodr.* iv. 144.—ENDL. *Gen.* n. 4430.—B. H. *Gen.* 901, n. 80.—H. BN. *Adansonia*, xii. 176.—HOOK. *Fl. Ind.* ii. 693.

[9] Generally white.

[10] SPRENG. *Rœm. et Sch. Syst.* vi. g. 45 (not ROTH).—DC. *Prodr.* iv. 162.—*Dethawia* ENDL. *Gen.* n. 4435.

wider (*Todaroa*[1]); sometimes rather thick little raised suberose (*Xatardia*[2]); secondary not conspicuous or very rarely slightly prominent (*Portenschlagia*[3]). Vittæ in furrows solitary or more rarely 2-nate, sometimes broad (*Portenschlagia*); the intrajugal sometimes more or less conspicuous (*Stenocœlium*,[4] *Bubonopsis*[5]). Mericarps sometimes hirsute broader (*Scaphespermum*[6]) or a little longer; ridges short (*Lomatopodium.*[7]) Carpophore 2-partite or 2-fid. Face of seed flat or slightly concave, sometimes more concave (*Diplolophium*[8]).—Perennial or biennial herbs, glabrous, pubescent or tomentose; leaves ternato-pinnately dissected or decompound, sometimes pinnately decompound (*Xatardia*); umbels compound; involucral bracts ∞, membranous free (*Diplolophium*, *Libanotis*[9]) or at base more or less connate in cupule (*Hippomarathroides*[10]), sometimes few, very small or 0 (*Todaroa*, *Xatardia*); bracteoles of involucels ∞, rarely (*Todaroa*) few or 0. (*North. temp. reg. of Old World, trop. E. Africa.*[11])

37? **Sclerochorton** Boiss.[12]—Flowers[13] polygamous; sepals dentiform. Petals obovate concave, at apex within produced to incurved lacinule. Style elongate. Fruit sessile (nearly of *Seseli*), subterete; mericarps compressed. Ridges 5, rather prominent. Vittæ in furrows 6, 7, very thin flexuose. Commissure broad, to 10-vittate. Seed concave at face.—Perennial many-stemmed herbs; leaves rigid decompound in petiolate lacinules; umbels compound; fertile flowers and fruit girt at base with sterile male flowers or pedicels.[14] (*Persia*, *Greece.*[15])

[1] Parlat. *Webb Phyt. Canar.* ii. 155, t. 74.—B. H. *Gen.* 900, n. 78.

[2] Meissn. *Gen.* 145 (105).—Endl. *Gen.* n. 4433.—B. H. *Gen.* 902, n. 82.—*Petitia* J. Gay, *Ann. Sc. Nat.* ser. 1, xxvi. 219 (not Jacq.).

[3] Vis. *Fl. Dalmat.* iii. 45 (not Tratt.).—B. H. *Gen.* 901, n. 79.

[4] Ledeb. *Fl. Alt.* i. 297; *Ic. Fl. Ross.* ii. 23, t. 175.—Endl. *Gen.* n. 4452.

[5] The type of which is *Bubon macedonicum* L. (*Seseli macedonicum* B. H. *Gen.* 901).

[6] Edgew. *Trans. Linn. Soc.* xx. 58.

[7] Fisch. et Mey. *Bull. Phys.-Math. Acad. Pétersb.* iii. (1845) 306.

[8] Turcz. *Bull. Mosc.* (1847) i. 173.—B. H. *Gen.* 900, n. 76.

[9] Crantz, *Fl. Austr.* 222.—Gærtn. *Fruct.* i. t. 21.—DC. *Mém.* 17; *Prodr.* iv. 149.—Endl. *Gen.* n. 4432.

[10] *Hippomarathrum* Riv. (not Link).—Gærtn. Mey. et Scherb. *Fl. d. Wetter.* ex DC. *Prodr.* iv. 144 (*Seseleos* sect. 1); *Mém.* 46.—Schur, *Enum. Pl. Transylv.* 256.

[11] Spec. about 50. Reichb. f. *Ic. Fl. Germ.* t. 1902, 1903, 1905–1913; 1915–1917 (*Libanotis*); 1927 (*Portenschlagia*).—Sibth. *Fl. Græc.* t. 275, 276 (*Athamantha*).—Vis. *Fl. Dalmat.* t. 28 (*Libanotis*), 29, 30.—Ledeb. *Ic. Fl. Ross.* t. 97, 104, 169, 171, 174.—Mor. *Fl. Sard.* t. 76.—Wight, *Icon.* t. 569 (*Cnidium*).—Wight and Arn. *Prodr.* 71.—Sm. *Exot. Bot.* t. 120.—Benth. *Fl. Austral.* iii. 373.—C. Gay, *Fl. Chil.* iii. 128.—Rupr. *Fl. Samoied.* t. 2 (*Libanotis*).—A. Gray, *Proc. Amer. Acad. Sc.* (1870) 287.—Harv. and Sond. *Fl. Cap.* ii. 549.—Boiss. *Fl. Or.* ii. 961.—Gren. et Godr. *Fl. de Fr.* i. 706 (*Dethawia*, *Xatardia*), 707.—*Bot. Mag.* t. 2073, 2259.—Walp. *Rep.* ii. 401, 403 (*Libanotis*, *Xatardia*); v. 864, 865 (*Todaroa*, *Libanotis*); *Ann.* i. 348, 349 (*Libanotis*); ii. 702; v. 69, 70 (*Libanotis*, *Portenschlagia*).

[12] *Fl. Or.* ii. 968.

[13] "White."

[14] Gen. in some respects very near to *Seseli*, in its inflorescence somewhat resembling *Pycnocycla*. Fruit certainly rather compressed.

[15] Spec. 2. Sm. *Prodr. Fl. Græc.* i. 200 (*Seseli*).—Boiss. et Heldr. *Diagn. Or.* ser. 1, vi. 60 (*Seseli*).

38 ? **Haussknechtia** Boiss.[1]—Flowers subasepalous; calyx composed of 5 small teeth. Petals [2] obovate concave; with long inflexed point. Styles curved, at base dilated to a single conical stylopod. Young [3] fruit subterete, somewhat compressed contrary to septum; septum thick lacunose; mericarps 5-angular; carpophore . . . ?—A perennial herb; leaves dissected; [4] scape high leafless much-branched, floriferous at apex; umbels compound subcapitate [5] globular, subsessile along branches of inflorescence; involucre small or 0; bracteoles of involucels few obtuse, equalling flowers, more or less connate, white-membranous.[6] (*West. Persia.*[7])

39. **Athamantha** L.[8]—Flowers [9] hermaphrodite or polygamous; sepals small, acute or subulate, sometimes (*Kundmannia* [10]) obtuse. Petals oftener narrowed to long inflexed or involute point, entire, emarginate or spuriously 2-lobed. Stylopods conical or thick, undulate or rugose at margin. Fruit oblong, transversely subterete, rather obtuse at apex (*Kundmannia*) or oftener subrostrate (*Euathamantha*, *Tinguarra* [11]). Primary ridges subequal, very slightly prominent, sometimes rather thick hard (*Kundmannia*). Vittæ in furrows solitary or 2–3-nate; the intrajugal sometimes thin. Carpophore 2-partite. Face of seed flat or rather concave, sometimes (*Tinguarra*) deeply sulcate.—Glabrous or canescent herbs; stock perennial; leaves pinnate, 2-pinnate or 3-nato-pinnately decompound; umbels compound, ∞ -rayed; involucral bracts ∞, few or 0; bracteoles of involucels ∞. (*Levant, south. Europe, Meditter. region, Canaries.*[12])

IV. CAREÆ.

40. **Carum** L.—Flowers hermaphrodite or polygamous. Sepals

[1] *Fl. Or.* ii. 960.

[2] "White."

[3] Mature unknown.

[4] Nearly of *Smyrnum* or *Pastinaca*.

[5] From pedicels and peduncle being very contracted but not quite absent.

[6] Gen. apparently very near to *Æthusa*, allied to some species of *Seseli*, especially not *Cyathoselinum*.

[7] Spec. 1. *H. elymaitica* Boiss. *loc. cit.*

[8] *Gen.* n. 338 (part).—Koch, *Umb.* 106, t. 49, 50 (not Scop.).—DC. *Prodr.* iv. 154 (part).—Endl. *Gen.* n. 4440.—B. H. *Gen.* 900, n. 77 (*Athamantha*).—H. Bn. *Adansonia*, xii. 177.—*Turbith* Tausch. *Flora* (1834), 343.—Endl. *Gen.* n. 4441.—*Petrocarvi* Tausch. *loc. cit.* 35.—Endl. *Gen.* n. 4531.

[9] White; petals often hirsute.

[10] Scop. *Introd.* (1777) 116.—DC. *Prodr.* iv. 143.—Endl. *Gen.* n. 4426.—B. H. *Gen.* 903, n. 83.—*Brignolia* Bertol. *Desvx. Journ. Bot.* iv. 76 (1814); *Am. It.* 97.—Mauri, *Pl. Rom.* ii. t. 2.—Koch, *Umb.* 107.—*Campderia* Lag. *Amœn. Nat.* ii. 99.

[11] Parlat. *Webb Phyt. Canar.* ii. 156, t. 71.—B. H. *Gen.* 896, n. 67. We have sometimes seen solitary vittæ in *T. cervariæfolia*.

[12] Spec. about 6. Jacq. *Ic. Rar.* t. 57; *Fl. Austr.* t. 62.—Reichb. f. *Ic. Fl. Germ.* t. 1889 (*Kundmannia*), 1934, 1935.—Boiss. *Fl. Or.* ii. 969, 976 (*Kundmannia*).—Walp. *Rep.* v. 867 (*Tinguarra*); *Ann.* ii. 701 (*Kundmannia*).

small or 0. Petals 5, unequal, retruse from costa being more or less intruded and margins dilated, emarginate, spuriously 2-lobed, or more rarely entire; point short or long inflexed. Stylopods high or depressed conical, entire at margin, sinuate or crenate. Fruit ovoid or oblong-ovoid, laterally (contrary to septum) more or less compressed exalate; primary ridges subequal hardly prominent; carpophore 2-partite or 2-fid, rarely entire, sometimes 0. Intrajugal vittæ rarely very thin, often 0. Face of seed flat, rather convex or slightly concave.—Annual or perennial herbs, glabrous or in parts pilose or hispid; leaves pinnate or ternately or pinnately decompound, rarely simple, entire or dentate; umbels compound; involucral bracts ∞, or oftener 0; bracteoles of involucels ∞, sometimes few or 0. (*All warm and temp. regions of the world.*)—See p. 117.

41 ? **Froriepia** C. Koch.[1]—Flowers[2] nearly of *Carum*; "Sepals very short. Petals oblong, cordate at base, apex coarctate in inflexed lacinule, medially carinate on upper face. Fruit ovoid laterally compressed. Mericarps with 5 primary and 4 secondary ridges; all filiform prominent equal; the lateral marginate. Stylopods depressed. Furrows evittate. Carpophore 2-fid at apex. Albumen convex, anteriorly rather flat."—Glabrous biennial herbs,[3] stem naked virgate; leaves lateral pinnatisect; cauline reduced to sheaths; umbels shortly or very unequally 3–4-radiate; bracts of involucres and involucels short oblong-lanceolate acute membranous.[4] (*Transcaucasia, north. Persia.*[5])

42. **Bulbocastanum** Lagasc.[6]—Flowers[7] (nearly of *Carum*) polygamous, subasepalous. Petals obovate, emarginate or spuriously 2-fid from inflexed apex. Fruit oblong or ovate-oblong, constricted at commissure, somewhat compressed laterally, shortly attenuate at apex. Primary ridges subequal filiform. Vittæ ∞, continuous or interrupted, often very thin or obscure. Carpophore 2-fid or 2-partite. Face of seed concave or deeply sulcate. Other characters

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[1] *Linnæa*, xvi. 362.—Boiss. *Fl. Or.* ii. 857 (whence the gen. char. here given).

[2] "Greenish white."

[3] "Face of *Petroselinum segetum*."

[4] "Gen. by the presence of secondary ridges and absence of vittæ distinct from *Petroselinum* as *Rumia* from *Trinia*." (Boiss.)

[5] Spec. 1. *F. subpinnata*.—*F. nuda* C. Koch.—*Bupleurum subpinnatum* Ledeb. *Eichw. Pl. Rar. Casp.* (1831–1833) 13, t. 11.—*Petroselinum segetum* Ledeb. *Fl. Ross.* ii. (1842) 242 (not Koch).

[6] *Amœn. Ac. Madr.* (1811) 99 (not Adans. nor Schur, nor Koch).—Guss. *Syn. Fl. Sic.* i. 340.—*Conopodium* Koch, *Nov. Acta Nat. Cur.* xii. (1824) 118 (part).—B. H. *Gen.* 896, n. 66.—*Bunium* DC. *Prodr.* iv. 116, 117 (part).—*Sphallerocarpus* Bess. *DC. Mém.* v. 60, t. 2N; *Prodr.* iv. 230.—Endl. *Gen.* n. 4509.—*Scaligeria* DC. *Mém.* 70; *Prodr.* iv. 248.—Endl. *Gen.* n. 4544.—*Butinia* Boiss. *Elench. Pl. Hisp. Austr.* 53; *Voy. Esp.* 270, t. 80.—*Elœosticta* Fenzl, *Flora* (1843), 458.—Hook. *Fl. Ind.* ii. 673.—*Heterotænia* Boiss. *Voy. Esp.* 267, t. 80 A.

[7] White.

of *Carum*.—Herbs; rhizomate or tuberous rooted; leaves 3-nato-pinnately dissected; umbels compound; bracts of involucres and involucels ∞, or oftener 0. (*Europe, north. Africa, west. and mid. Asia.*[1])

43? **Sison** L.[2]—Flowers[3] (nearly of *Carum*) asepalous; point of petals long-inflexed. Stylopods thick depressed. Fruit short-ovoid, sub-2-dymous, compressed or constricted at commissure. Primary ridges subequal obtuse. Vittæ in furrows solitary and short, broadly subclavate, sometimes interrupted, obtuse below. Carpophore 2-partite. Face of seed nearly flat or slightly concave. Other characters of *Carum*.—A slender herb, 1–2-carpous; leaves pinnate inciso-dentate or ∞-fid; umbels compound; involucral bracts setaceous few; bracteoles of involucels very small or 0.[4] (*Europe, Levant.*[5])

44. **Ammi** T.[6]—Flowers[7] (nearly of *Carum*) hermaphrodite or more rarely polygamous; calyx short or 0. Stylopods shortly conical or depressed entire. Fruit ovate or sub-2-dymous; vittæ in furrows solitary; carpophore 2-partite. Face of seed flat or slightly concave. Other characters of *Carum*.—Perennial or 2-carpous glabrous herbs; leaves decompound, 3-nato-pinnate; segments serrulate; umbels compound; involucral bracts ∞, 3-sect or rarely entire; bracteoles of involucels ∞, entire.[8] (*Europe, Medit. region, north.-west. African islands.*[9])

45. **Cicuta** L.[10]—Flowers[11] nearly of *Sison*; sepals acute. Stylopods depressed entire. Fruit broadly ovate, suborbicular or broader than long, sometimes subdidymous, compressed contrary to septum and transversely elliptical, more or less constricted at commissure. Primary ridges thick obtuse (white); epicarp thin, sometimes separable; vittæ solitary, narrow or thick;[12] carpophore 2-partite. Seed sub-

[1] Spec. 6, 7. Boiss. *Fl. Or.* ii. 875 (*Scaligeria*).—Gren. et Godr. *Fl. de Fr.* i. 742 (*Conopodium*).—Walp. *Ann.* iii. 900 (*Heterotænia*).

[2] *Gen.* n. 349.—Koch, *Umb.* 123.—Lag. *Amœn.* ii. 103.—DC. *Prodr.* iv. 110.—B. H. *Gen.* 892, n. 57.

[3] White.

[4] Gen. scarcely autonomous, rather a sect. of *Carum*, and differing from it as *Heracleum* from *Peucedanum*, viz. the vittæ being shorter than the fruit.

[5] Spec. 2. Reichb. *Ic. Fl. Germ.* t. 1859.—Boiss. *Fl. Or.* ii. 893.—Walp. *Rep.* 392; *Ann.* ii. 697.

[6] *Inst.* 304, t. 159.—L. *Gen.* n. 334.—Spreng. *Umb. Prodr.* 41.—Koch, *Umb.* 122.—DC. *Prodr.* iv. 312.—Endl. *Gen.* n. 4404.—B. H. *Gen.* 889, n. 53.—*Visnaga* Gærtn. *Fruct.* i. 92, t. 21.—*Gohoria* Neck. *Elem.* n. 287.

[7] White.

[8] Gen. scarcely autonomous, rather a sect. of *Carum*, involucral bracts occasionally divided.

[9] Spec. 5, 6. Jacq. *Hort. Vindob.* iii. t. 26 (*Daucus*).—Reichb. *Ic. Fl. Germ.* t. 1864.—Guss. *Pl. Rar.* t. 25.—Sibth. *Fl. Græc.* t. 273.—Boiss. *Fl. Or.* ii. 891 (part).—Gren. et Godr. *Fl. de Fr.* i. 731.

[10] *Gen.* n. 354.—Hoffm. *Umb.* 177.—Spreng. *Umb.* 19.—Koch, *Umb.* 129.—DC. *Prodr.* iv. 99.—Endl. *Gen.* n. 4391.—B. H. *Gen.* 889, n. 52.—*Cicutaria* T. *Inst.* 322 (part).—Lamk. *Dict.* ii. 2.

[11] White.

[12] Commissural vittæ broad, transverse sect. subcruciate.

terete, flat or slightly convex at face, sometimes angular.—Glabrous perennial herbs;[1] leaves pinnate or pinnately decompound; umbels compound; involucral bracts few or 0; bracteoles of involucels ∞, small.[2] (*North. hemisph. of both worlds.*[3])

46. **Sium** T.[4]—Flowers[5] nearly of *Sison;* sepals dentiform acute. Stylopods depressed conical entire. Fruit ovate or oblong, sometimes subdidymous, compressed contrary to septum and more or less constricted at commissure. Carpels obtusely 5-gonal; ridges subequal obtuse or incrassate; epicarp sometimes (*Berula*[6]) and to the furrows more or less incrassate or granular; vittæ ∞; carpophore thin or scarcely conspicuous simple. Styles divaricate or reflexed, sometimes capitellate. Seed transversely subterete.—Glabrous herbs; leaves pinnate; pinnæ dentate; flowers in lateral or terminal umbels; involucral bracts and bracteoles of involucels ∞.[7] (*North. hemisph. of both worlds, South Africa.*[8])

47. **Apium** T.[9]—Flowers[10] nearly of *Carum;* petals oftener entire, sometimes scarcely acuminate (*Helosciadium*[11]). Stylopods shortly conical or depressed, entire at margin. Fruit shortly ovate, suborbicular or broader than long or didymous, compressed contrary to septum and constricted at commissure, rounded at base, or oftener more or less emarginate (*Euapium*[12]); mericarps 5-gonal; primary ridges rather prominent subequal, sometimes rough or slightly hispid (*Leptocaulis*[13]); vittæ in furrows solitary or scarcely conspicuous; carpophore simple or at apex shortly 2-fid, rarely 2-partite (*Oreoscia-*

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[1] Aquatic, marshy, sometimes bulbiferous.

[2] Qy. if of this genus or rather of *Sison* (?) *Platyraphe* Miq. (*Ann. Mus. Lugd.-Bat.* iii. 56) a Japanese plant unknown to us.

[3] Reichb. f. *Ic. Fl. Germ.* t. 1853.—A. Gray, *Man.* (ed. 5) 196.—S.-Wats. *King's Rep. Bot.* 121.—Gren. et Godr. *Fl. de Fr.* i. 739.

[4] *Inst.* 308, t. 162.—L. *Gen.* n. 348 (part).—Koch, *Umb.* 117.—DC. *Prodr.* iv. 424.—Spach, *Suit. à Buffon,* viii. 200.—Endl. *Gen.* n. 4413.—B. H. *Gen.* 893, n. 60.—Hook. *Fl. Ind.* ii. 683.—*Sisarum* T. *Inst.* 308, t. 163.—Adans. *Fam. des Pl.* ii. 97.

[5] White.

[6] Koch, *Deutschl. Fl.* ii. 433.—Endl. *Gen.* n. 4412.

[7] An irregular genus to be carefully revised, in some cases apparently very near *Carum,* in others *Apium.*

[8] Spec. 3, 4 (v. 7, 8 ?). Reichb. f. *Icon. Fl. Germ.* t. 1877.—Harv. and Sond. *Fl. Cap.* ii. 539.—Fr. et Sav. *Enum. Pl. Jap.* i. 181.—Miq. *Ann. Mus. Lugd.-Bat.* iii. 57.—A. Gray, *Man.* (ed. 5) 196.—S.-Wats. *King's Rep. Bot.* 121.—Chapm. *Fl. S. Unit. St.* 162.—Hook. f. *Icon.* t. 1032.—Boiss. *Fl. Or.* ii. 888.—Gren. et Godr. *Fl. de Fr.* i. 726.—Walp. *Rep.* ii. 396; *Ann.* ii. 700.

[9] *Inst.* 305, t. 160.—L. *Gen.* n. 367.—Hoffm. *Umb.* i. 75.—Koch, *Umb.* 128.—DC. *Mém.* 36; *Prodr.* iv. 100.—Spach, *Suit. à Buffon,* viii. 183.—Endl. *Gen.* n. 4393.—B. H. *Gen.* 888, n. 49.—Hook. *Fl. Ind.* ii. 678.

[10] White or rarely yellowish.

[11] Koch, *Umb.* 125.—DC. *Mém.* 37; *Prodr.* iv. 104.—Endl. *Gen.* n. 4397.—*Mauchartia* Neck. *Elem.* n. 286.—*Critamus* Hoffm. *Umb.* 182 (not Bess.).

[12] DC. *Prodr.* iv. 101, sect. 1.—*Cyclospermum* Lag. *Amœn.* ii. 101.

[13] Nutt. ex DC. *Mém.* 39, t. 10; *Prodr.* iv. 107.—Endl. *Gen.* n. 4399.—*Spermolepis* Rafin. (not Ad. Br.).

dium.[1]) Seed transversely subterete, flat or convex at face.—Annual or perennial herbs, generally glabrous; leaves pinnate or decompound, 3-nato-pinnate; umbels terminal, lateral or oppositifolious, compound; involucral bracts ∞ (*Oreosciadium*), few, 1 or 0; bracteoles of involucels ∞ (*Helosciadium*), or 0 (*Leptocaulis*, *Euapium.*[2]) (*All warm and temp. regions of the world.*[3])

48. **Apiastrum** NUTT.[4]—Flowers[5] of *Apium*, subasepalous; petals ovate or suborbicular concave entire. Anthers sub-2-dymous; with submarginal clefts. Styles short; stylopods small. Fruit shortly ovate or obcordate-2-dymous, much compressed contrary to septum, at base very emarginate; commissure narrow; primary ridges very little prominent subequal warty, curved below; vittæ solitary; carpophore 2-partite. Face of seed slightly convex flat or more rarely slightly concave.—Slender annuals; leaves dissected; segments linear or filiform; umbels compound oftener oppositifolious; the exterior sometimes longer stipitate; involucres and involucels 0.[6] (*South west. N. America.*[7])

49. **Apinella** NECK.[8] — Flowers[9] (nearly of *Apium*) polygamo-diœcious; sepals dentiform or 0. Petals oftener entire. Stylopods depressed conical; margin undulate. Fruit (nearly of *Apium*) broadly ovate or 2-dymous, constricted at commissure; mericarps sub-5-gonal; primary ridges rather thick smooth (*Eutrinia*) or plicately lobed or rugose (*Rumia*[10]). Secondary ridges sometimes slightly conspicuous (*Rumia*). Vittæ in furrows solitary or 0. Carpophore 2-partite. Seed subterete or angular and sulcate.—Glabrous perennial herbs; leaves decompound; umbels compound; involucral bracts

[1] WEDD. *Chlor. Andina.* ii. 203, t. 69.—B. H. *Gen.* 889, n. 51.—*Niphogeton* SCHLECHT., exs. *Lechl.* (ex B. H.). Fruit as in *Euapium* generally a little longer.

[2] Qy. if *Froriepia* (C. KOCH, *Linnæa*, xvi. 362; —BOISS. *Fl. Or.* ii. 857), is a sect. of this gen.; the secondary ridges in its fruit are slightly prominent, and vittæ said to be 0?

[3] Spec. about 15. LABILL. *N.-Holl.* t. 103.—VENT. *Malmais.* t. 81.—CLOS, *C. Gay Fl. Chil.* iii. 118, 122 (*Helosciadium*).—HOOK. F. *Handb. N. Zeal. Fl.* 89.—BENTH. *Fl. Austral.* iii. 371.—HARV. and SOND. *Fl. Cap.* ii. 534.—HIERN, *Fl. Trop. Afr.* iii. 41.—MIQ. *Ann. Mus. Lugd.-Bat.* iii. 57.—BOISS. *Fl. Or.* ii. 856.—REICHB. F. *Ic. Fl. Germ.* t. 1846 (15), 1854, 1855.—H. B. K. *Nov. Gen. et Sp. Pl. Æquin.* t. 421.—GREN. et GODR. *Fl. de Fr.* i. 735 (*Helosciadium*), 738.—WALP. *Rep.* ii. 391; *Ann.* v. 65.

[4] Ex TORR. et GR. *Fl. N.-Amer.* i. 643.—ENDL. *Gen.* n. 4549[1].—B. H. *Gen.* 887, n. 48.

[5] White.

[6] "Gen. differing a little from *Apium* sect. *Euapium* by its 2-partite carpophore, from *Oreosciadium* in habit, from both by its fruit at base being emarginate with two roundish lobes." (B. H. *loc. cit.*)

[7] Spec. 2. TORR. *Emory's Rep. Bot.* t. 28.—WALP. *Rep.* ii. 428.

[8] *Elem.* n. 326.—*Spielmannia* CUSS. (not MED.). —*Trinia* HOFFM. *Gen. Umb.* 92.—KOCH, *Umb.* 127.—DC. *Prodr.* iv. 103.—ENDL. *Gen.* n. 4396. —B. H. *Gen.* 887, n. 48.

[9] White or yellowish.

[10] HOFFM. *Umb.* 171, t. tit. fig. 3, 4, 17, 21 (not LINK).—KOCH, *Umb.* 129, adn.—DC. *Mém. Omb.* 36; *Prodr.* iv. 98.—ENDL. *Gen.* n. 4390.

few or 0; bracteoles of involucels ∞, or 0. (*Temp. Asia, Medit. reg.*[1])

50. **Szovitzia** Fisch. and Mey.[2]—Flowers[3] nearly of *Triania;* calyx minute or 0. Petals obovate, at apex produced to an inflexed lacinule. Fruit obovate-oblong, somewhat compressed contrary to septum; primary ridges scarcely conspicuous filiform; secondary thicker suberose, transversely 1-seriately plicate-lobed; vittæ in furrows solitary thin; carpophore entire or 2-fid above. Face of seed concave.—Glabrous annuals;[4] leaves alternate, 3-nately dissected; umbels compound; involucre 0; bracteoles of involucels ∞, small.[5] (*Caucasian reg.*[6])

51. **Lichtensteinia** Cham. and Schlchtl.[7]—Flowers[8] hermaphrodite or polygamous; sepals rather large acute. Petals entire; point long inflexed. Styles short; stylopods conical, long adnate. Fruit oblong or ovoid, compressed contrary to septum, sometimes slightly constricted at commissure; mericarps subterete or 5-gonal. Primary ridges subequal thick obtuse, traversed by vittæ[9] within; vittæ in furrows little conspicuous or 0; carpophore 2-partite. Seed subterete, nearly flat at face, often longitudinally sulcate at vittæ.—Perennial herbs;[10] stem erect naked or few-leaved; radical leaves simple, acutely dentate, 3-sect, pinnatifid or pinnately dissected; umbels compound; involucres and involucels ∞-bracteate.[11] (*South Africa, St. Helena.*[12])

52. **Rhyticarpus** Sond.[13]—Flowers nearly of *Lichtensteinia;* sepals acute. Petals entire; costa not impressed, point long involved. Styles short, dilated at base to broadly conical stylopods. Fruit ovoid

[1] Spec. 8, 9. Waldst. et Kit. *Pl. Rar. Hung.* t. 72 (*Pimpinella*).—Jacq. *Fl. Austr.* t. 28 (*Pimpinella*).—Leder. *Ic. Fl. Ross.* t. 8 (*Trinia*).—Reichb. f. *Ic. Fl. Germ.* t. 1870–1872 (*Trinia*). Boiss. *Fl. Or.* ii. 852, 853 (*Rumia*).—Gren. et Godr. *Fl. de Fr.* i. 737 (*Trinia*).—Walp. *Rep.* ii. 391 (*Rumia*), 392 (*Trinia*); v. 848; *Ann.* i. 344 (*Rumia*).

[2] *Ind. Sem. Hort. Petrop.* i. 39.—Endl. *Gen.* n. 4500.—B. H. *Gen.* 925, n. 137.

[3] White.

[4] Habit somewhat of *Cuminum* or *Rumia.*

[5] Qy. if to *Szovitzia* should be referred *Aphanopleura trachysperma* Boiss. (*Fl. Or.* ii. 855), an Armenian herb whose secondary ridges are said to be narrower and scarcely prominent, its other characters being apparently sufficiently congruous?

[6] Spec. 1. *S. callicarpa* Fisch. et Mey.—Boiss. *Fl. Or.* ii. 855.—Walp. *Rep.* v. 901.

[7] *Linnæa* i. 394, t. 5, fig. 3.—Endl. *Gen.* n. 4416.—B. H. *Gen.* 887, n. 47.

[8] "Yellow."

[9] Thick cylindrical and filled with a dense oleo-resinous substance.

[10] "With aromatic odour."

[11] "A genus approaching the *Saniculeæ* in vittæ. Fruit in form sometimes of the *Ammineæ*, sometimes nearly of the *Seselineæ*. Flowers nearly of *Heteromorpha*." (B. H.) The same authors (*Gen.* 1008) doubtfully refer to this genus *Ruthea Herbanica* Bolle (*Verh. d. Bot. Ver. Prov. Brandeb.* [1862] t. 1, 2) whose furrows however appear widely vittate.

[12] Spec. 7, 8. Harv. and Sond. *Fl. Cap.* ii. 542.—Hook. f. *Icon. Pl.* t. 1033.—Walp. *Rep.* ii. 399.

[13] *Fl. Cap.* ii. 540.—B. H. *Gen.* 887, n. 46.

or ovately pear-shaped, compressed contrary to septum, emarginate at base from decurrent mericarps; commissure rather broad; primary ridges subequally prominent obtuse, often rugulose; vittæ in furrows solitary broad not prominent; carpophore 2-partible. Seed subterete, flat or rather concave at face.—Perennial herbaceous or subshrubby, rarely shrubby plants, rigid glabrous; leaves 3-sect; segments or folioles pinnately dentate, sometimes reduced to terete petiole; umbels compound; bracts of involucres and involucels small few or 0.[1] (*South Africa, Madagascar.*[2])

53. **Heteromorpha** Cham. and Schlchtl.[3]—Flowers[4] nearly of *Rhyticarpus;* sepals acute. Petals entire or subentire; point long involute. Stylopods conical; dilated at base to undulate margin. Fruit subovate, compressed contrary to septum; mericarps unequally 3–5-gonal. Primary ridges dilated to prominent, 3-angular unequal wings;[5] vittæ in furrows conspicuous, oftener solitary; carpophore 2-partite. Seed transversely subterete.—A glabrous shrub;[6] leaves 2–3-lobed or 1–3-foliolate; umbels compound; bracts of involucres and involucels ∞, small.[7] (*Trop. and south. Africa.*[8])

54. **Pyramidoptera** Boiss.[9]—Flowers[10] polygamous; sepals dentiform. Petals obovate-cuneate emarginate; point inflexed. Stylopods conical. Fruit obpyramidal, indehiscent, equally 5-alate; wings 3-angular rather thick, long attenuate below, above confluent with base of sepals. Mericarps unequal; one 3-alate; the other 2-alate oftener sterile; carpophore scarcely conspicuous or 0; vittæ ∞, very thin irregular. Seed compressed at back, at face flat or rather concave.—A glabrous perennial herb;[11] caudex thick; leaves

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[1] A gen. very near to *Lichtensteinia* differing only in the nature of the vittæ; "from *Heteromorpha* it differs only in its exalate ridges, from *Bupleurum* it is more distinct as well from its calycinal teeth and disk as that all its leaves, at least of a young plant, are compound." (B. H.)

[2] Spec. about 4. Thunb. *Fl. Cap.* 254 (*Œnanthe*).—Harv. and Sond. *Fl. Cap.* ii. 541, n. 2 (*Bupleurum*).

[3] *Linnæa*, i. 385, t. 5.—DC. *Mém.* 43; *Prodr.* iv. 134.—Endl. *Gen.* n. 4415.—B. H. *Gen.* 887, n. 45.

[4] "Yellowish."

[5] Wings in one carpel oftener 3, in the other 2; sometimes 1, 2 narrower interposed. The larger often continuous with base of sepals.

[6] With habit of some *Bupleura*, sometimes in its leaves resembling some cultivated *Araliæ*.

[7] A gen. in some respects apparently very near to *Bupleurum*, in others to *Rhyticarpum*.

[8] Spec. 1, polymorpha, scil. *H. arborescens* Cham. et Schlchtl.—Harv. and Sond. *Fl. Cap.* ii. 542.—Hiern, *Oliv. Fl. Trop. Afr.* iii. 10.—*H. abyssinica* Hochst.—*H. collina* Eckl. et Zeyh.—*Bupleurum arborescens* L.—Thunb. *Fl. Cap.* 247.—*B. trifoliatum* Wendl. et Bartl. *Beitr.* ii. 13.—*Tenoria arborescens* Spreng. *Prodr. Umb.* (ex DC.).

[9] *Diagn. Or.* ser. 2, ii. 106; *Fl. Or.* ii. 1089.—B. H. *Gen.* 903, n. 86.

[10] "White."

[11] "Face of *Laserpitium*."

mostly radical, lanceolate from shortly sheathing petiole, 2-pinnatisect; segments short; laciniæ rigid acute; umbels compound; bracts of involucres and involucels ∞, linear or more rarely dissected, deflexed.[1] (*Cabulia.*[2])

55. **Bupleurum** T.[3]—Flowers[4] hermaphrodite or polygamous; sepals scarcely conspicuous or 0. Petals rather broad, ovate or rotundate, subcucullate from costa widely prominent, apex inflexed or induplicate, oftener coarctate in lacinule. Styles short; stylopods depressed entire. Fruit compressed contrary to septum; mericarps 5-gonal. Primary ridges subequal, acute or subulate, sometimes rather thick or subobsolete; lateral marginate. Vittæ in furrows solitary or ∞, irregular, sometimes interrupted and unequally dispersed or 0; vittæ sometimes also thin intrajugal. Carpophore 2-fid or 2-partite. Seed subterete, smooth or sulcate, at face rather convex, flat or more or less sulcate or concave; margins sometimes involute. —Annual, perennial or shrubby herbs, often rigid glabrous; leaves entire, often linear or perfoliolate or cordate; umbels or capitules compound; bracts of involucres and involucels ∞, foliaceous or narrow, sometimes few or 0. (*All trop. and temp. reg. of the world.*[5])

56. **Hohenackeria** Fisch. and Mey.[6]—Flowers[7] nearly of *Bupleurum;* sepals unequal acute 2–5. Stylopods conical. Fruit ovoid,[8] commissure broad;[9] mericarps subterete. Ridges subequal suberose-incrassate. Vittæ thin solitary or 0. Seed sulcate.—Low glabrous

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[1] A gen. of doubtful place, a peculiar tribe of *Pyramidoptera* (according to Boiss.) by others (B. H.) placed between *Actinanthus* (*Œnanthe*) and *Magydaris*, not far from *Theocarpus*.

[2] Spec. 1. . *cabulica* Boiss. *loc. cit.*

[3] *Inst.* 309, t. 163.—L. *Gen.* n. 328.—Lag. *Amœn.* ii. 100.—Koch, *Umb.* 114, fig. 51, 52.—Spreng. *Syst.* i. 880.—DC. *Prodr.* iv. 127.—Spach, *Suit. à Buffon*, viii. 176.—Endl. *Gen.* n. 4414.—B. H. *Gen.* 887, n. 44.—H. Bn. *Adansonia*, xii. 177.—Hook. *Fl. Ind.* ii. 674.—*Agostana* Salisb. *Gr. Brit. Pl.* ii. 526.—*Diaphyllum* Hoffm. *Umb.* 112.—*Isophyllum* Hoffm. *loc. cit.* —*Tenoria* Spreng. *Umb. Prodr.* 27.—*Buprestis* Spreng. *loc. cit.*—*Odontites* Spreng. *loc. cit.*—*Diatropa* Dumrt. *Fl. Belg.* 76.—*Trachypleurum* Reichb. *Consp.* 43.—? *Orimaria* Rafin. *Ser. Bull. Bot.* 218 (ex Endl.).

[4] Yellow or greenish.

[5] Spec. about 60 (enumer. to 100). Cav. *Icon.* t. 106.—Jacq. *Ic. Rar.* t. 56, 351.—Desf. *Fl. Atl.* t. 56, 57.—Reichb. f. *Ic. Fl. Germ.* t. 1880–1891.—Sibth. *Fl. Græc.* t. 260–264.—Guss. *Pl. Rar.* t. 22, 23.—Jaub. et Spach, *Ill. Pl. Or.* t. 236.—Fenzl, *Ill. Pl. Syr.* t. 18; *Tchihatch. As. Min. Bot.* i. 417.—Eichw. *Pl. Casp.* t. 10, 11.—Kl. *Waldem. Reis.* t. 50–52.—Wight, *Icon.* t. 281, 1006, 1007.—Miq. *Ann. Mus. Lugd.-Bat.* iii. 58.—A. Gray, *Man.* (ed. 5) 195.—Chapm. *Fl. S. Un. St.* 162.—Harv. and Sond. *Fl. Cap.* ii. 541 (part).—Fr. et Sav. *Enum. Pl. Jap.* i. 179. —Boiss. *Diagn. Or.* ser. 2, ii. 81; v. 97; vi. 73; *Fl. Or.* ii. 834.—Gren. et Godr. *Fl. de Fr.* i. 716.—Walp. *Rep.* ii. 396, 937; v. 859; *Ann.* i. 347; ii. 700; iii. 897; v. 67.

[6] *Ind. Sem. Hort. Petrop.* ii. 38; *Bull. Sc. Nat. Mosc.* (1838) 320.—Endl. *Gen.* n. 4388.—B. H. *Gen.* 886, n. 43.

[7] "Greenish white or yellow."

[8] "Or heteromorphous from mutual pressure."

[9] Receptacle produced beyond cells in short tube and crowned with persistent subspinescent sepals.

annuals; leaves opposite (or lowest alternate) linear entire; flowers sessile capitate ebracteate.[1] (*Medit. and Cauc. reg.*[2])

57. **Coriandrum** T.[3]—Flowers[4] hermaphrodite or polygamous; sepals minute or conspicuous, very unequal, the larger the more anterior. Petals unequal (anterior larger) obovate, emarginately 2-lobed from impressed costa and dilated margins.[5] Stylopods more or less highly conical, sometimes depressed (*Astomœa*[6]). Fruit either subovoid or subglobose (*Eucoriandrum*, *Keramocarpus*[7]), or broader than long, 2-dymous or 2-globose (*Bifora*,[8] *Atrema*,[9] *Schrenckia*,[10] ? *Cryptodiscus*[11]); mericarps transversely terete or semiterete.[12] Primary and secondary ridges slightly prominent, the latter stronger (*Eucoriandrum*); the former sometimes flexuose; or both scarcely conspicuous (*Bifora*); or primary ridges more prominent than secondary (*Schrenckia*). Carpels within more or less, sometimes very (*Bifora*) concave. Vittæ 0, very thin, irregular or ∞ (*Astomœa*); the commissural oftener more distinct. Carpophore 2-partite, simple or 0. Seed conformed to mericarp, at face more or less concave orbicular. —Glabrous herbs, perennial or oftener slender annual; leaves pinnately dissected; segments 1, 2-morphous, ovate rather broad or linear pinnatifid dissected; umbels compound; bracts of involucres and involucels various, linear, short, few or 0.[13] (*Medit. reg.*, *Levant*, *N. America.*[14])

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[1] A genus now referred to the *Saniculeæ*.

[2] Spec. 1, 2, Cesati, *Linnæa*, xi. 323, t. 7.—Fisch. *Sert. Petrop.* tab.—Coss. *Ann. Sc. Nat.* ser. 4, v. 137, t. 9, 10.—Boiss. *Fl. Or.* ii. 833.—Walp. *Rep.* ii. 391.

[3] *Inst.* 316, t. 168.—J. *Gen.* 220.—Hoffm. 186.—Koch, *Umb.* 82.—DC. *Prodr.* iv. 250.—Spach, *S. à Buff.* viii. 141.—Endl. *Gen.* n. 4549.—B.H. *Gen.* 925, n. 138.—Hook. *Fl. Ind.* ii. 717.

[4] White.

[5] Lobes in anterior petals larger, in lateral unequal; anterior lobe larger; posterior petal sometimes simple.

[6] Reichb. *Pfl. Syst.* 218.—*Astoma* DC. *Mém.* 71, t. 17; *Prodr.* iv. 249.—Endl. *Gen.* n. 4547.—B. H. *Gen.* 885, n. 41.

[7] Fenzl, *Ill. Pl. Nov. Syr. et Taur.* 80, t. 20.

[8] Hoffm. *Umb.* 191.—Koch, *Umb.* 83.—DC. *Prodr.* iv. 249.—Endl. *Gen.* n. 4546.—B. H. *Gen.* 926, n. 139.—*Biforis* Spreng. *Rœm. et Sch. Syst.* vi. 38.—*Corion* Link et Hffmsg. *Fl. Port.* ii. 457.—Link, *Enum. Hort. Ber.* 280.—*Anidrum* Neck. *Elem.* n. 319.

[9] DC. *Mém.* 71, t. 18; *Prodr.* iv. 250.—Endl. *Gen.* n. 4548.

[10] Fisch. et Mey. *Schrenck Enum.* 63.

[11] Schrenck, *Enum.* 64.—Kar. et Kir. *Bull. Mosc.* (1842) 369.

[12] Exocarp in *Astomœa* rather fleshy.

[13] *Fuernrohria* (C. Koch, *Linnæa*, xvi. 356) recently placed near *Coriandrum* (Boiss. *Fl. Or.* ii. 919), a genus whose mature fruit is imperfectly known, but "from its habit, odour and nature of pericarp apparently to be located near *Coriandrum*." Vittæ in furrows are said to be 2-nate; in the immature fruit they are not distinctly seen. Primary marginal ridges of the mericarps are rather prominent, "the rest obsolete."

[14] Spec. about 10. Sibth. *Fl. Græc.* t. 283.—Wight, *Icon.* t. 516.—Miq. *Ann. Mus. Lugd.-Bat.* iii. 65.—C. Gay, *Fl. Chil.* iii. 144.—Boiss. *Fl. Or.* ii. 919 (*Astoma*), 920, 921 (*Bifora*), 934 (*Cryptodiscus*).—Walp. *Rep.* ii. 427 (*Schrenckia*, *Cryptodiscus*), 428.

58. **Physospermum** Cuss.[1]—Flowers[2] hermaphrodite or polygamous; sepals short or 0. Petals long or obovate; point elongate involute. Stylopods conical. Fruit shortly ovate or 2-dymous, constricted at commissure; mericarps transversely subterete; primary ridges scarcely prominent filiform; vittæ in furrows solitary large; carpophore simple. Seed concave at face, transversely reniform.—Glabrous perennial herbs; leaves decompound, 3-nato-pinnate; segments incised; umbels compound; bracts of involucres and involucels ∞, linear. (*Europe, Caucasian reg.*[3])

59. **Molopospermum** Koch.[4]—Flowers polygamous; sepals very small deciduous. Petals oblong entire; apex acuminate incurved or inflexed. Stylopods conical, at base entire or submarginate. Fruit oblong-obovoid, compressed contrary to septum and much constricted at commissure; mericarps transversely unequally-4-gonal. Primary dorsal and intermediate ridges expanded to thick prismatic wings; lateral at commissure subaborted small, sometimes incurved; vittæ in furrows solitary large; carpophore 2-partite. Seed convex at back, at face concave, deeply sulcate at vittæ.—Glabrous perennial herbs; leaves pinnately decompound; umbels compound; bracts of involucres and involucels ∞, linear, sometimes foliaceous pinnatifid. (*Mid. and south-west. Europe.*[5])

60. **Smyrnium** T.[6])—Flowers[7] hermaphrodite or oftener polygamous; calyx minute or 0. Petals entire or emarginate. Stylopods conical or depressed, sometimes undulate at margin (*Eulophus*[8]). Fruit ovoid or broader than long, but sometimes longer (*Eleutherospermum*[9]),

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[1] Ex. J. *Mém. Soc. Méd. Par.* (1782) 279.—Spreng. *Mém. Soc. Mosc.* v. fig. 1–3.—Koch, *Umb.* 134.—DC. *Prodr.* iv. 246.—Endl. *Gen.* n. 4540.—B. H. *Gen.* 882, n. 29.—*Danaa* All. *Fl. Pedem.* ii. 34, t. 63 (not Sm.).—*Hœnselera* Lag. *Gen. et Sp. Nov.* 13.—*Alschinra* Vis. *Fl. Dalmat.* iii. 69.

[2] White.

[3] Spec. about 3. Sm. *Gen. Ic. Pict.* t. 11 (*Ligusticum*).—Sow. *Engl. Bot.* (ed. 3) t. 630.—Guss. *Prodr.* i. 355.—Brot. *Fl. Lus.* 37 (*Sison*).—Waldst. et Kit. *Pl. Rar. Hung.* ii. 186, t. 171 (*Laserpitium*).—Gren. et Godr. *Fl. de Fr.* i. 748.—Walp. *Rep.* ii. 426.

[4] *Nov. Acta Nat. Cur.* xii. 108.—DC. *Prodr.* iv. 230.—Endl. *Gen.* n. 4510.—B. H. *Gen.* 882, n. 30.

[5] Spec. 1. *M. cicutarium* DC.—Reichb. f. *Ic. Fl. Germ.* t. 2012.—Gren. et Godr. *Fl. de Fr.* i. 747.—*Ligusticum peloponesiacum* L. *Spec.* 360.—Jacq. *Fl. Austr.* App. t. 13.—*L. peloponense* Lamk. *Dict.* iii. 576.—*L. cicutarium* Lamk. *Fl. Fr.* iii. 453.—*Cicutaria latifolia fœtida* Bauh. *Pin.* 161.

[6] *Inst.* 315, t. 168.—L. *Gen.* n. 363.—Lag. *Amœn.* ii. 101.—Koch, *Umb.* 133.—DC. *Prodr.* iv. 247.—Spach, *Suit. à Buffon*, viii. 177.—Endl. *Gen.* n. 4541.—B. H. *Gen.* 885, n. 38.

[7] Yellow or "white."

[8] Nutt. *DC. Mém.* 69, fig. 2; *Prodr.* iv. 248.—B. H. *Gen.* 885, n. 40.—*Perideridia* Reichb. *Pflanzensyst.* 219.—Endl. *Gen.* n. 4543.

[9] C. Koch, *Linnæa*, xvi. 365.—Boiss. *Fl. Or.* ii. 924.

compressed contrary to septum or 2-dymous from contracted commissure. Mericarps transversely subterete; primary dorsal and intermediate ridges, sometimes also the lateral (*Smyrniopsis* [1]) rather prominent; all sometimes scarcely conspicuous; vittæ in furrows solitary or oftener ∞, or few (*Smyrniopsis*), sometimes with thin endocarp adhering to seed; carpophore 2-partite. Seed subglobose or ovoid, deeply hollowed at face; cotyledons ovate, round or more rarely linear oblong.—Glabrous perennial or biennial herbs; leaves radical 3-nately or 3-nato-pinnately decompound; segments linear (*Eulophus*) or broad dentate-lobed; umbels compound; involucral bracts few or 0; bracteoles of involucels ∞, small, few or 0.[2] (*Europe, north. Africa, west. Asia, Japan?, north. and south. Andean America.*[3])

61. **Conium** L.[4]—Flowers [5] hermaphrodite or polygamous; calyx short or 0. Petals obovate-cuneate, or broadly ovate (*Vicatia* [6]), emarginate or subentire from slightly or scarcely impressed costa. Stylopods depressed conical, entire or undulate (*Vicatia*) at margin. Fruit short- (*Euconium*) or long-ovoid, compressed contrary to septum, constricted at commissure. Mericarps obtusely 5-gonal; primary ridges obtuse or filiform, sometimes undulately crenulate; vittæ ∞, thin unequal or 0 (*Euconium* [7]); carpophore simple or shortly 2-fid. Seed angular deeply sulcate at face.—Glabrous biennial or perennial herbs; leaves pinnately decompound; segments inciso-pinnatifid; umbels compound; involucral bracts few or 1, oftener small; bracteoles of involucels ∞, small or linear. (*North. hemisph. of both worlds, trop. east. and south. Africa.*[8])

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[1] Boiss. *Ann. Sc. Nat.* ser. 3, ii. 72; *Fl. Or.* ii. 927.

[2] Qy. if of this gen. *Nothosmyrnium* (Miq. *Ann. Mus. Lugd.-Bat.* iv. 58), a Japanese plant unknown to us, according to authors allied to *Smyrnium* or to *Pimpinella?*

[3] Spec. about 10. Sibth. *Fl. Græc.* t. 289.—Sow. *Engl. Bot.* (ed. 3) t. 631.—Waldst. et Kit. *Pl. Hung. Rar.* t. 23.—All. *Fl. Pedem.* t. 72.—Sch. *Syst.* vi. 440.—H. B. K. *Nov. Gen. et Sp.* v. 15 (*Cnidium*).—A. Gray, *Bost. Journ. Nat. Hist.* vi. 211 (*Tauschia*); *Man.* (ed. 5) 198 (*Eulophus*).—Boiss. *Fl. Or.* ii. 925.—Gren. et Godr. *Fl. de Fr.* i. 749.—Walp. *Ann.* i. 357; ii. 722 (*Smyrniopsis*).

[4] *Gen.* n. 336.—Hoffm. *Umb.* 99.—Lag. *Amœn.* ii. 103.—Koch, *Umb.* 135, fig. 40.—DC. *Prodr.* iv. 242.—Spach, *Suit. à Buffon*, viii. 179.—Endl. *Gen.* n. 4532.—B. H. *Gen.* 883, n. 34.—H. Bn. *Adansonia*, xii. 178.—*Anosmia* Ashers. *Bull. Soc. Linn. Par.* 225.—*Cicuta* T. *Inst.* 306, t. 160.—Gærtn. *Fruct.* i. 100, t. 22.—Hook. *Fl. Ind.* ii. 679.

[5] White.

[6] DC. *Prodr.* iv. 243.—Endl. *Gen.* n. 4533.—B. H. *Gen.* 883, n. 34.—Hook. *Fl. Ind.* ii. 670.

[7] Vittæ described by authors as very thin irregular; pericarps appear externally parietal rather thick yellowish.

[8] Spec. about 3, one of which is *C. maculatum* (p. 183, note 1). Concerning the others see Harv. and Sond. *Fl. Cap.* ii. 567.—Kl. *Waldem. Reis. Bot.* t. 45, 46 (*Chærophyllum*).—Boiss. *Diagn. Or.* ser. 2, v. 103; *Fl. Or.* ii. 922.—A. Gray, *Man.* (ed. 5) 197.—Walp. *Rep.* ii. 425.

62. **Arracacia** Bauer.[1]—Flowers[2] nearly of *Conium;* sepals small. Petals subentire; point inflexed. Stylopods conical, undulate at margin. Fruit ovoid or ovoid-oblong, often pointed at apex, compressed (sometimes much) contrary to septum and more or less constricted at commissure. Mericarps transversely subterete or 5-gonal; primary ridges little or scarcely prominent, sometimes unequal. Vittæ ∞, often irregular or unequally confluent. Carpophore 2-partite. Seed at face concave sulcate or involute.—Perennial herbs, glabrous or puberulous; subterranean[3] part sometimes thickened tuberose; leaves pinnate or decompound; segments various in form, dentate or pinnatifid; umbels compound; involucral bracts very few or 1, foliaceous, oftener 0; bracteoles of involucels ∞, sometimes 1-lateral exterior, entire foliaceous or small. (*Both Andean and southwest. Americas.*[4])

63. **Trachidium** Lindl.[5]—Flowers[6] without or with dentiform sepals. Petals entire or emarginate. Stylopods conical or depressed. Fruit ovate or oblong-ovate, compressed contrary to septum and oftener constricted at commissure; exocarp loose membranous; ridges obtuse unequally vesiculate, sinuately rugose or smooth; carpophore 2-fid or 2-partite. Face of seed concave; raphe sometimes slightly prominent.—Annual or perennial herbs; inferior leaves pinnate; segments generally dentate or dissected; umbels compound; pedicels of umbellules often elongate; involucral bracts membranous dentate or dissected; bracteoles of involucels ∞, conformed or narrow. (*Temp. west. and centr. Asia.*[7])

64. **Musenium** Nutt.[8]—Flowers[9] hermaphrodite; sepals 5 well evolved, unequal,[10] persistent. Petals unguiculate, subentire or emarginate; point oftener long-induplicate. Styles short or elongate; stylopods depressed or squamiform. Fruit ovoid, rugose or muricate, somewhat compressed contrary to septum; carpels dorsally compressed,

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[1] *Trans. Agr. Soc. Jam.* ex *Linnæa*, iv. *Litt. Ber.* 13.—B. H. *Gen.* 884, n. 38.—*Arracacha* DC. *Prodr.* iv. 243; *Not. Pl. Rar. Hort. Genev.* 5, t. 1.—Endl. *Gen.* n. 4534.—H. Bn. *Diot. Encycl. Sc. Méd.* v. 772.

[2] White or (?) yellowish.

[3] Root (?) or rhizome (?).

[4] H. B. K. *Nov. Gen. et Sp.* t. 420 (*Conium*).—Hook. *Exot. Fl.* t. 152 (*Conium*); *Bot. Mag.* t. 3092.—Walp. *Rep.* v. 920.

[5] *Royle Ill. Himal.* 232.—Endl. *Gen.* n. 4443.—B. H. *Gen.* 884, n. 37.—Hook. *Fl. Ind.* ii. 671.—*Haplosciadium* Hochst. *Flora* (1844), 20.—*Eremodaucus* Bge. *Del. Sem. Hort. Dorp.; Mém. Sav. Étrang. Acad. Pétersb.* vii. 316.

[6] "White."

[7] Jacquem. *Voy. Bot.* t. 79 (whence fig. 149, 150).—Boiss. *Diagn. Or.* 1, vi. 59 (*Rumia*); x. 55 (*Prangos*); *Ann. Sc. Nat.* ser. 3, i. 126; *Fl. Or.* ii. 929.—Walp. *Rep.* v. 869.

[8] *Torr. et Gr. Fl. N.-Amer.* i. 642.—Endl. *Gen.* n. 4543[3].—B. H. *Gen.* 884, n. 36.

[9] "Yellow or white."

[10] 2 anterior generally larger.

5-gonal; primary ridges rather prominent; marginal quite contiguous; vittæ ∞; carpophore simple or 2-fid. Seed concave at face.—Glabrous, sometimes cæspitose perennial herbs; leaves pinnately decompound; segments pinnatifid; umbels compound; involucres 0; bracts of involucels setaceous generally few.[1] (*N. America.*[2])

65. **Tauschia** Schlchtl.[3]—Flowers[4] subasepalous; petals shortly emarginate. Stylopods depressed. Fruit ovoid, compressed contrary to septum and constricted at commissure; carpels 5-gonal; primary ridges equally rather prominent sometimes thick; vittæ in furrows solitary; carpophore simple. Face of seed concave; margins involute.—Low glabrous perennial herbs; leaves "subradical" pinnate or 2-pinnate; segments dentate; umbels compound; involucral bracts 0 or few foliaceous-lobed; bracteoles of involucels conformed few. (*Andean Mexican and Equadorean America.*[5])

66. **Erigenia** Nutt.[6]—Flowers[7] subasepalous; calyx very short annular undulate. Petals oblong-lanceolate entire straight. Styles elongately subulate, dilated externally at base to thick squamose stylopods. Fruit broadly ovoid, sub-2-dymous, emarginate at base, compressed contrary to septum; mericarps subterete; pericarp thin; primary ridges thin; vittæ ∞; carpophore not or scarcely distinct. Seed transversely curved, broadly concave at face.—A low spreading glabrous herb; subterranean portion tuberous; leaves 3-nato-pinnate decompound; umbels compound small rather dense; bracteoles of involucels simple subfoliaceous.[8] (*N. America.*[9])

67. **Oliveria** Vent.[10]—Flowers polygamous;[11] sepals dentiform very short setose. Petals subsessile; point long induplicate adnate; costa rather prominent within; margins produced upwards in lobes.

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[1] "A genus very near to *Vicatia*" (B. H.).

[2] Spec. 2, 3. Pursh, ex *Bot. Mag.* t. 1742 (*Seseli*).—Walp. *Rep.* ii. 427.

[3] *Linnæa*, ix. 607 (not Presl).—Endl. *Gen.* n. 4512.—B. H. *Gen.* 882, n. 31.

[4] "Yellow."

[5] Spec. 2. A. Gray, *Pl. Lindheim.* 211.—Walp. *Rep.* v. 937; *Ann.* ii. 719.

[6] *Gen. Amer.* i. 187.—DC. *Prodr.* iv. 71; *Mém.* 27.—Endl. *Gen.* n. 4359.—B. H. *Gen.* 882, n. 31.

[7] "White."

[8] Only a sect. of this genus appears *Oregenia linearifolia* (S. Wats. *King's Rep. Bot.* [1871] 120, t. 14), unknown to us, the subterranean tuberous part of which is crowned with 1, 2, ternate leaves; inflorescence subcompound few-flowered; fruit ovoid surrounded by rather thick margin of carpels; vittæ obscure solitary in furrows; face of mericarps and seed concave and surrounded by a suberose column thick in the middle, even at margins.

[9] Type species *E. bulbosa* Nutt. *loc. cit.*—Torr. *Fl. N. York*, t. 39.—A. Gray, *Man.* (ed. 5) 198.—Walp. *Rep.* ii. 384.

[10] *Jard. Cels.* t. 21.—Lag. *Amœn.* ii. 105.—DC. *Prodr.* iv. 234.—Endl. *Gen.* n. 4519.—B. H. *Gen.* 890, n. 55.—*Callistroma* Fenzl, *Endl. Gen.* Suppl. iii. 82.

[11] In the same umbellule generally male and fertile ∞ intermixed.

Styles erect capitellate at stigmatose apex, thickened at base to long-conical stylopods. Fruit oblong ovoid, compressed contrary to septum, white-setose; mericarps subterete; carpophore 0. Primary ridges subequal scarcely prominent; vittæ in furrows solitary. Seed concave at face.—Rigid (scented) annuals; branches glabrous; leaves pinnate; segments dissected; umbels compound capitate dense; pedicels short thick subligneous; involucral bracts foliaceous dissected; bracteoles of involucels cuneate-dentate. (*Levant.*[1])

68. **Chærophyllum** T.[2]—Flowers [3] hermaphrodite or often polygamous; sepals subulate rigid, persistent, minute or 0. Petals subentire or emarginate. Styles slender sometimes rigid (*Rhyncostylis* [4]). Stylopods conical or depressed, entire or more rarely undulate at margin. Fruit oblong, oblong-linear, linear-elongate (*Grammosciadium* [5]) or ovately oblong, compressed contrary to septum, sometimes constricted at commissure; carpophore simple or 2-fid. Primary ridges equal, sometimes wider (*Physocaulis* [6]), obtuse or inconspicuous; vittæ in furrows solitary, sometimes obscure or 0 (*Anthriscus* [7]). Seed subterete, often dorsally compressed, at face deeply sulcate or concave. —Annual, biennial or perennial herbs; root sometimes tuberous (*Freyera* [8]); leaves pinnately dissected or compound or 3-nately compound; umbels compound or more rarely simple (*Oreomyrrhis* [9]); involucral bracts oftener few (1, 2), sometimes 0; bracteoles of involucels ∞. (*Temp. and mount. reg. of both worlds.*[10])

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[1] Spec. 1. *O. decumbens* Vent.—Jaub. et Spach, *Ill. Pl. Or.* t. 431.—*O. orientalis* DC.—Boiss. *Fl. Or.* ii. 894.—*O. Bruguieri* Spach, *loc. cit.* v. 34.—*O. Aucheri* Spach, *loc. cit.*—*Callistroma erubescens* Fenzl.

[2] *Inst.* 314, t. 166.—L. *Gen.* n. 358.—Hoffm. *Umb.* i. 33.—Koch, *Umb.* 130.—DC. *Prodr.* iv. 224.—Endl. *Gen.* n. 4506.—B. H. *Gen.* 898, n. 71.—Hook. *Fl. Ind.* ii. 690.

[3] White or rarely yellow.

[4] Tausch. *Flora* (1834), 343.

[5] DC. *Mém.* 62, t. 2; *Prodr.* iv. 232.—Endl. *Gen.* n. 4516.

[6] Tausch. *Flora* (1834), 342. — *Biasolettia* Bertol. *Fl. Ital.* iii. 191 (not Koch).

[7] Hoffm. *Umb.* 38.—Koch, *Umb.* 131.—DC. *Prodr.* iv. 122.—Endl. *Gen.* n. 4505.—B. H. *Gen.* 899, n. 74.—Hook. *Fl. Ind.* ii. 692.

[8] Reichb. *Pflanzensyst.* 291.—Endl. *Gen.* n. 4514.—*Biasolettia* Koch, *Syn. Fl. Germ.* 318 (not Bert. nor Presl).—*Balansæa* Boiss. et Reut. *Pug. Pl. Nov.* 49.

[9] Endl. *Gen.* n. 4508.—B. H. *Gen.* 897, n. 70. —*Caldasia* Lag. *Amœn.* ii. 98 (not W. nor Mut.).

[10] Spec. about 40. Reichb. f. *Ic. Fl. Germ.* t. 2015 (*Physocaulis*), 2016-2023; 2024-2029 (*Anthriscus*).—Vis. *Fl. Dalm.* t. 26, 27 (*Anthriscus*). —Ten. *Fl. Nap.* t. 129, 130.—H.B.K. *Nov. Gen. et Sp.* v. t. 419 (*Myrrhis*).—Hook. *Icon.* t. 300 (*Caldasia*).—Hook. f. *Fl. Antarct.* t. 101 (*Caldasia*); *Handb. N. Zeal. Fl.* 90 (*Oreomyrrhis*).—Desf. *Fl. Atl.* t. 74 (*Scandix*).—Benth. *Fl. Austral.* iii. 377 (*Oreomyrrhis*).—Wedd. *Chlor. Andina*, ii. 206 (*Oreomyrrhis*).—A. Gray, *Man.* (ed. 5) 197.—Chapm. *Fl. S. Un. St.* 165.—Clos. *C. Gay Fl. Chil.* iii. 138 (*Anthriscus*), 140 (*Oreomyrrhis*). —Hiern. *Oliv. Fl. Trop. Afr.* iii. 16 (*Anthriscus*). — Miq. *Ann. Mus. Lugd.-Bat.* iii. 64 (*Anthriscus*).—Fr. et Sav. *Enum. Pl. Jap.* i. 183 (*Anthriscus*).—Boiss. *Fl. Or.* ii. 895 (*Freyera*), 899 (*Grammosciadium*), 901, 898 (*Physocaulos*), 910 (*Anthriscus*).—Gren. et Godr. *Fl. de Fr.* i. 741 (*Anthriscus*), 743.—Walp. *Rep.* ii. 422; v. 904

69 ? **Rhabdosciadium** Boiss.[1]—Flowers [2] polygamous (nearly of *Chærophyllum*); sepals acute, persistent. Petals emarginate; point inflexed. Stylopods conical. Fruit linear-elongate, somewhat or scarcely compressed contrary to septum. Primary ridges subequal obtuse, or the marginal dilated to narrow wings. Vittæ in furrows solitary, thin or irregular; the commissural wider. Carpophore 2-fid. Seed at face more or less concave.—Glabrous perennial herbs; branches few-leaved; leaves reduced to petioles, or the lower with a scanty limb; segments few, dentate or lobulate; umbels compound; central flower sessile fertile; surrounding males pedicellate.[3] (*Persia.*[4])

70. **Myrrhis** T.[5]—Flowers [6] polygamous (nearly of *Chærophyllum*); sepals very small or 0. Petals spuriously emarginately 2-lobed. Stylopods shortly conical or pulvinate, oftener entire. Fruit oblong- or elongate-linear, compressed contrary to septum, more or less constricted at commissure; mericarps 5-gonal. Primary ridges equal, rather thick or acutely prominent, sometimes ciliate (*Osmorhiza* [7]); carpophore thin or rather thick, 2-fid; vittæ in furrows very thin or 0, sometimes ∞ (*Osmorhiza*). Face of seed more or less deeply sulcate.—Perennial herbs, glabrous or hirsute, often very aromatic; leaves pinnately or ternato-pinnately decompound; segments dentate or pinnatifid; umbels compound; involucral bracts very few or 0; bracteoles of involucels ∞, membranous, sometimes deciduous or 0. (*Mount. Europe, north. and east. Asia, India, N. and south. temp. Andean America.*[8])

71. **Scandix** T.[9]—Flowers [10] (of *Chærophyllum*) hermaphrodite or

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(*Anthriscus*), 905, 908 (*Grammosciadium*); *Ann.* ii. 718; v. 78, 79 (*Oreomyrrhis*).

[1] *Ann. Sc. Nat.* ser. 3, ii. 68; *Fl. Or.* ii. 898.—B. H. *Gen.* 898, n. 72 (part).

[2] "White."

[3] Pedicels springing from axil of bract sessile at bottom of receptacle; whence inflorescence somewhat resembles that of *Petagnia*. The flowers also resemble *Crenosciadium*.

[4] Spec. 3. Boiss. *loc. cit.*—Walp. *Rep.* v. 909.

[5] *Inst.* 315 (part), t. 166.—Scop. *Fl. Carniol.* i. 207.—DC. *Prodr.* iv. 231.—Endl. *Gen.* n. 4513.—B. H. *Gen.* 897, n. 69.—*Lindera* Adans. *Fam. des Pl.* ii. 499 (not Thunb.).—*Glycosma* Nutt. *Torr. et Gr. Fl Amer.* i. 639.—Endl. *Gen.* n. 4515[1].

[6] White.

[7] Rafin. *Journ. Phys.* 89.—DC. *Prodr.* iv. 232.—Endl. *Gen.* n. 4515.—B. H. *Gen.* 897, n. 68.—Hook. *Fl. Ind.* ii. 690.—*Uraspermum* Nutt. *Gen. Nov. Amer.* i. 192 (not J.).—*Spermatura* Reichb. *Consp.* 141.

[8] Reichb. *Ic. Fl. Germ.* t. 2013.—Hook. *Fl. Bor.-Amer.* t. 96, 97 (*Osmorhiza*).—Torr. *Fl. N. York*, t. 38 (*Osmorhiza*).—Royl. *Ill. Himal.* t. 52 (*Osmorhiza*).—A. Gray, *Man.* (ed. 5) 197 (*Osmorhiza*).—Chapm. *Fl. S. Un. St.* 166 (*Osmorhiza*).—Fr. et Sav. *Enum. Pl. Jap.* i. 183 (*Osmorhiza*).—S.-Wats. *King's Rep. Bot.* 122.—Boiss. *Fl. Or.* ii. 910.—Gren. et Godr. *Fl. de Fr.* i. 746.—Walp. *Rep.* ii. 423 (*Osmorhiza, Glycosma*).

[9] *Inst.* 326, t. 173.—L. *Gen.* n. 357 (part).—Gærtn. *Fruct.* ii. 33, t. 85.—Lag. *Amœn.* ii. 37.—Koch, *Umb.* 132.—DC. *Prodr.* iv. 220.—Endl. *Gen.* n. 4504.—B. H. *Gen.* 899, n. 73.—Hook. *Fl. Ind.* ii. 692.

[10] White or yellowish-green, oftener very small crowded.

polygamous. Stylopods more or less dilated at base, sometimes undulate. Fruit [1] oblong-linear, produced above to long or very long beak,[2] compressed contrary to septum; carpophore simple or 2-fid. Primary ridges subequal rather prominent, sometimes rather broad. Vittæ in furrows solitary, thin, obscure or 0. Face of seed deeply sulcate; margins generally involute.—Annuals, glabrous or pubescent; leaves pinnately decompound; umbels compound or rarely simple; involucral bracts 1 (or 0); bracteoles of involucels ∞, entire or dissected. (*North hemisph. of old world.*[3])

72? **Ottoa** H. B. K.[4]—Flowers [5] generally polygamous (nearly of *Scandix* or *Chærophyllum*), subasepalous; petals oblong entire; point long inflexed. Styles elongate slender capitellate; stylopods depressed conical. Fruit nearly of *Chærophyllum*, oblong; vittæ in furrows solitary; carpophore 2-partite. Face of seed concave sulcate.—A glabrous perennial herb; leaves [6] terete fistular transversely septate; umbels compound; involucre and involucels 0.[7] (*Mexico, Columbia.*[8])

V. HYDROCOTYLEÆ.

73. **Hydrocotyle** T.—Flowers hermaphrodite or polygamous; receptacle variously sacciform. Calyx small or 0, inserted at margin of receptacle with 5 petals, entire concave, acute or obtuse, in præfloration valvate or imbricate (*Centella*). Stamens 5, epigynous, inserted under depressed disk. Germen inferior, 2-celled; cells 1-ovulate. Fruit shortly ovate, suborbicular or 2-dymous, much compressed contrary to septum, often constricted at commissure; carpophore simple or rarely 2-fid, sometimes 0. Primary ridges little prominent or nervelike subequal; dorsal marginate; intermediate little

[1] The central fruit of the umbellules is of different form in *Cyclotaxis* (Boiss. *Diagn. Or.* x. 48; ser. 2, v. 101; *Fl. Or.* ii. 218).

[2] From char. of beak 2 sect. are distinguished: 1. *Pecten* (Dub. *Bot. Gall.* i. 240;—DC. *Prodr.* 221, sect. 1), beak ecostate and dorsally compressed; 2. *Wylia* (Hoffm. *Umb.* i. 3, t. 2;—DC. *loc. cit.* sect. 2), beak subterete or laterally compressed.

[3] Spec. about 9. Vent. *Jard. Cels.* t. 14.—Reichb. f. *Ic. Fl. Germ.* t. 2029, 2030.—Sibth. *Fl. Græc.* t. 285.—Boiss. *Fl. Or.* ii. 914.—Gren. et Godr. *Fl. de Fr.* i. 740.—Walp. *Rep.* ii. 421; v. 903; *Ann.* ii. 717, 718 (*Cyclotaxis*).

[4] *Nov. Gen. et Sp.* v. 20, t. 423.—DC. *Prodr.* iv. 136.—Endl. *Gen.* n. 4417.—B. H. *Gen.* 899, n. 75.

[5] "White."

[6] Reduced to petal?

[7] Perhaps better a sect. of *Chærophyllum*, of singular habit (nearly the same as *Crantzia* to *Œnanthe*).

[8] Spec. 1. *O. œnanthoides* H. B. K.—*Œnanthe quitensis* Spreng. *Syst.* i. 888.

raised or scarcely conspicuous; lateral at commissure more or less interior or exterior. Secondary ridges sometimes subequal to primary, rarely reticulate; intrajugal vittæ thin or 0. Seed laterally much compressed.—Annual or perennial herbs, erect or with a rhizome radial at the nodes, sometimes low subshrubby; leaves alternate entire, dentate or crenate, palminerved or palmately dissected, occasionally reniform or 3-angular, sometimes peltate or cordate; stipules (?) scarious, entire, lacerate or 0; flowers in simple or compound umbels, sometimes in few-flowered cymes; common peduncle sometimes bearing 2-pluriverticillate flowers, or (*Micropleura*) terminated by a fertile flower; the 2 or few others peripheric pedicellate sterile inserted under germen; bracts of involucres few or 0. (*All warm and temp. regions, often aquatic.*)—See p. 139.

74. **Trachymene** Rudge.[1]—Flowers[2] polygamous; sepals 3–5, unequal or 0. Petals 5, unequal, entire, concave, highly imbricate. Styles slender, sometimes capitellate at apex; stylopods discoid, flat or cupuliform, sometimes scarcely conspicuous. Fruit much compressed contrary to septum; carpels 2, equal; one sometimes smaller aborted or naked;[3] carpophore simple. Primary ridges equal filiform, or unequal; the dorsal bordering the mericarps wider or subalate; the lateral concealed in commissure; the intermediate rather prominent curved or branched; intrajugal vittæ thin or 0. Seed laterally compressed.—Glabrous, or pilose[4] or hirsute herbs; leaves dentate or 3-nato-dissected; receptacle of simple umbels concave capituliform; bracts of involucre linear.[5] (*Australia, N. Caledonia.*[6])

75. **Xanthosia** Rudge.[7]—Flowers polygamous; sepals evolute, ovate, lanceolate, at base cordate or peltate, sometimes decurrent-

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[1] *Trans. Linn. Soc.* x. (1811) 300, t. 21 (not DC.).—Spreng. *Umb.* 8.—Koch, *Umb.* 143.—DC. *Mém.* 28; *Prodr.* iv. 72.—Endl. *Gen.* n. 4362.—B. H. *Gen.* 873, n. 3.—H. Bn. *Adansonia*, xii. 178.—*Huegelia* Reichb. *Consp.* 144 (1828); *Ic. Exot.* t. 201.—*Didiscus* DC. *Bot. Mag.* t. 2875 (1828); *Prodr.* iv. 72.—Endl. *Gen.* n. 4361.—*Lampra* Lindl. (ex DC.).—*Dimetopia* DC. *Prodr.* iv. 71.—*Cesatia* Endl. *Ann. Wien. Mus.* ii. 200.—*Pritzelia* Walp. *Rep.* i. 428.—*Hemicarpus* F. Muell. *Hook. Kew Journ.* ix. 18.

[2] White or azure.

[3] The posterior; whilst the fertile anterior is oftener covered with hairs or prickles.

[4] Hair white simple.

[5] Free; the cavity of the receptacle having been taken for the adnate base of the bracts. Receptacle at earlier age quite as in the *Compositæ*.

[6] Spec. about 13. Hook. *Icon.* t. 304, 307 (*Didiscus*).—Benth. *Fl. Austral.* iii. 347.—Br. et Gr. *Ann. Sc. Nat.* ser. 5, iii. 235 (*Didiscus*).—Lindl. *Bot. Reg.* t. 1225.—F. Muell. *Fragm.* ix. 46 (*Didiscus*).—Walp. *Ann.* v. 59 (*Didiscus*).

[7] *Trans. Linn. Soc.* x. 301, t. 22.—DC. *Mém.* 31; *Prodr.* iv. 74.—B. H. *Gen.* 874, n. 5.—*Leucolæna* R. Br. *Flind. Voy. App.* ii. 557.—Endl. *Gen.* n. 4364.—*Cruciella* Lesch. (ex DC.).—*Schænofæna* Bge. *Pl. Preiss.* i. 289.—*Pentapeltis* Bge *loc. cit.* 292.

auriculate, membranous (coloured), imbricate. Petals with adnate induplicate point, retuse from costa impressed above, emarginate or spuriously 2-lobed, induplicate-valvate or imbricate. Stamens fertile elongate; filaments incurved; anthers introrse, sometimes apiculate. Styles (in female flowers) elongate, incurved; stylopods subplane or thickly squamiform within and concave above. Fruit subovate or obovate, compressed contrary to septum, at base highly emarginate or cordate; carpophore simple. Primary ridges subequal thin, curved or branched; secondary sometimes ∞, unequal. Seed laterally compressed.—Small shrubs or herbs, erect or decumbent, glabrous or with simple and stellate hairs; leaves entire, dentate, lobed or 3-nato-dissected; umbels compound or subcapitate; bracts of involucre small or sometimes large (coloured), unequal or 1-lateral; flowers[1] sometimes few or rarely solitary. (*Australia.*[2])

76. **Siebera** Reichb.[3]—Flowers[4] hermaphrodite or polygamous; sepals dentiform or 0. Petals subequal or unequal, entire or retuse; point sometimes shortly inflexed; valvate or imbricate in præfloration. Styles slender; stylopods depressed disklike. Fruit compressed contrary to septum; primary ridges thin often curved; dorsal sometimes rather prominent marginate. Other characters of *Trachymene*. —Perennial herbs or virgate shrubs; leaves entire, few or squamiform; the lower sometimes dissected; umbels simple or at top of twigs compound; involucral bracts few or 0. (*Australia.*[5])

77. **Azorella** Lamk.[6]—Flowers[7] hermaphrodite or polygamous; sepals minute or more rarely conspicuous subpetaloid, sometimes 0. Petals 5, of various form, entire or retuse, imbricate or subvalvate. Stylopods thick depressed or conical. Fruit very various in form, either subterete or transversely subquadrate, or more or less compressed contrary or parallel to the septum, more or less (sometimes much)

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[1] White or pink.

[2] Spec. 17. Hook. *Icon.* t. 45 (*Leucolæna*); *Bot. Mag.* t. 3582.—Benth. *Enum. Pl. Hueg.* 55 (*Leucolæna*); *Fl. Austral.* iii. 357.

[3] *Consp.* (1828) 145 (not *Siebera* J. Gay, which is a sect. of *Xeranthemum*).—B. H. *Gen.* 874, n. 4.—H. Bn. *Adansonia*, xii. 178.—*Trachymene* DC. *Prodr.* iv. 72 (not Budge). — *Fischera* Spreng. *Umb. Prodr.* (1813) 27 (part), not *Fischeria* DC. (1813).—*Platysace* Bge. *Pl. Preiss.* i. 285.—*Platycarpidium* F. Muell. *Hook. Kew Journ.* ix. 309.

[4] White, small.

[5] Spec. about 14. Cav. *Icon.* t. 485 (*Azorella*). —Labill. *N.-Holl.* t. 99–101 (*Azorella*).—Hook. *Bot. Mag.* t. 3334 (*Trachymene*).—Benth. *Fl. Austral.* iii. 351.

[6] *Dict.* i. 344 (1783); Suppl. i. 551; *Ill.* t. 189. —J. *Gen.* 226, 453.—Gaudich, *Ann. Sc. Nat.* ser. 1, v. 104, t. 3.—DC. *Prodr.* iv. 77.—Endl. *Gen.* n. 4366.—B. H. *Gen.* 874, n. 6.—*Chamitis* Banks, *Gærtn. Fruct.* i. 94, t. 22.—*Bolax* Commers. *J. Gen.* 226.

[7] White or yellowish.

constricted at commissure, 2-scutate (*Spananthe*[1]); carpophore simple. Exocarp sometimes fleshy; endocarp harder (*Apleura*[2]). Primary ridges subequally prominent or obscure; lateral sometimes at face (*Spananthe*), oftener apart at commissure; jugal vittæ more or less conspicuous. Seed subterete, obtusely angular or nearly flat at face. Perennial or rarely annual herbs; stem cæspitose (*Apleura*, *Microsciadium*,[3] *Pozoa*[4]), pulvinate (*Fragosa*[5]) or 2-chotomous ramose (*Spananthe*); leaves (partly) opposite (*Spananthe*), or imbricate or reduced to sheaths, at base naked or scariously ciliate (*Fragosa*); or subradical; petiole elongate (*Microsciadium*, *Pozoa*); stipules (?) scarious entire or lacerate, often 0; flowers solitary terminal (*Apleura*) or in simple or irregularly compound umbels; peduncles subequal to leaves or shorter (*Fragosa*); bracts of involucres free or connate at base (*Fragosa*, *Microsciadium*), sometimes rayed, connate to middle or much higher (*Pozoa*). (*Arctic and temp. Andean Americas, Australia, N. Zealand.*[6])

78. **Klotzschia** Cham.[7]—Flowers polygamo-monœcious (nearly of *Azorella*); sepals evolute, persistent. Petals 5, narrow, uncinate at pointed apex, within carinate above. Styles subulate, at base thickened to conical stylopods. Fruit ovoid striated; carpels semiterete; commissure wide; carpophore simple. Primary ridges subequally obtuse; dorsal and commissural 3; intrajugal vittæ thin or 0. Seed at face nearly flat or rather concave.—Glabrous herbs; leaves[8] peltate digitinerved, 3–5-angular, lobed or, except at denticulate margin, entire; inflorescence cymiform;[9] central flower hermaphrodite sessile

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[1] Jacq. *Coll.* iii. 247 (1789); *Ic. Rar.* ii. t. 350.—Koch, *Umb.* 142.—DC. *Prodr.* iv. 81.—Endl. *Gen.* n. 4376.—B. H. *Gen.* 876, n. 9.

[2] Phil. *Linnæa*, xxxiii. 89.—B. H. *Gen.* 875, n. 7.

[3] Hook. f. *Hook. Lond. Journ.* vi. 468.—*Oschatzia* Walp. *Ann.* i. 340.—? *Dichopetalum* F. Muell. *Hook. Kew Journ.* vii. 378, t. 11.

[4] Lag. *Nov. Gen. et Sp.* 13; *Amœn.* ii. 93.—DC. *Prodr.* iv. 82.—Endl. *Gen.* n. 4377.

[5] R. et Pav. *Fl. Per. Prodr.* 43, t. 54.—Lag. *Amœn.* ii. 93.—Rich. *Ann. Sc. Phys.* iv. t. 51.—DC. *Prodr.* iv. 76.—*Pectophytum* H. B. K. *Nov. Gen. et Sp.* v. 28, t. 425.—DC. *Prodr.* iv. 78.

[6] Spec. about 30. Cav. *Icon.* t. 484, fig. 2.—R. et Pav. *Fl. Per. et Chil.* t. 249, 250 (*Fragosa*).—H. B. K. *Nov. Gen. et Sp.* t. 424 (*Fragosa*).—Turp. *Dict. Sc.* Atl. t. 11 (*Hydrocotyle*).—Field et Gard. *Sert. Pl.* t. 40.—Hook. *Bot. Misc.* i. t. 46 (*Pozoa*), 63; *Ic. Pl.* t. 492 (*Bolax*).—Phil. *Fl. Atam.* 24.—Clos. *C. Gay Fl. Chil.* iii. 78, t. 30.—Hook. f. *Fl. N.-Zel.* t. 18; *Fl. Antarct.* t. 11 (*Pozoa*); *Handb. N. Zeal. Fl.* 87 (*Pozoa*).—Benth. *Fl. Austral.* iii. 364.—Walp. *Rep.* ii. 386, 937; *Ann.* i. 341, 343 (*Spananthe*), 977; ii. 693 (*Bolax*); v. 59 (*Microsciadium*), 60, 62 (*Bolax*, *Pozoa*).

[7] *Linnæa*, viii. 327.—Endl. *Atakt.* 21, t. 19; *Gen.* n. 4381 (*Klotzschia*).—B. H. *Gen.* 880, n. 23.

[8] In that resembling some *Hydrocotyleæ* of the same region.

[9] Sometimes 1-flowered.

fertile; peripheric sterile or hermaphrodite few pedicellate.[1] (*Trop. Brazil.*[2])

79. **Laretia** Gill.[3]—Flowers nearly of *Azorella;* sepals 3-angular, persistent. Petals entire, imbricate. Styles long slender, at base dilated to conical stylopods. Fruit subovoid, dorsally compressed and much constricted at commissure, whence 2-scutate; mericarps at back plano-concave, cuneate within; carpophore simple. Primary ridges filiform; dorsal intermediate at back; lateral bordering mericarps; intrajugal vittæ thin. Seed flat at back.—A low dense cæspitose herb;[4] stem perennial thick very short; leaves alternate rosulate entire rather rigid, at base dilated to sheath; umbels simple; bracts foliaceous scarious sublanceolate; pedicels articulate under flower. (*Chili.*[5])

80. **Mulinum** Pers.[6]—Flowers (nearly of *Laretia*) polygamous; sepals expanded acute. Fruit much compressed at very narrow commissure, 2-scutate, transversely cruciate; mericarps at back angulately concave, aliform at margins; carpophore simple or 0. Primary ridges very thin; dorsal in cavity of mericarp; intermediate at margin; lateral on face and distant from commissure; intrajugal vittæ thin. Seed compressed or depressed at back, at face flat or rather convex.—Cæspitose-ramose undershrubs; leaves rigid sharp, 3–5-fid or 3–5-sect; petiole sometimes dilated to scarious-ciliate sheath; umbels simple; involucral bracts short free or connate at base. (*And. and Arct. America.*[7])

81. **Hermas** L.[8]—Flowers[9] monœcious or polygamous; sepals expanded ovate or lanceolate, often petaloid, imbricate, persistent. Petals 5, filamentary, inflexed. Stamens 5; filaments alternating with and similar to petals; anthers short exserted. Styles slender straight, obtuse at apex, dilated at base to short conical stylopods. Fruit (of

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[1] A genus closely allied to *Azorella* and *Micropleura*.

[2] Spec. 1 (or 2?). Walp. *Rep.* v. 844.

[3] Ex Hook. and Arn. *Bot. Misc.* i. 329, t. 65.—Endl. *Gen.* n. 4371.—B. H. *Gen.* 875, n. 8.

[4] Habit of *Azorella*.

[5] Spec. 1. *L. acaulis* Hook.—C. Gay, *Fl. Chil.* iii. 106.—Wedd. *Chlor. Andina*, ii. 199, t. 70, A.—Walp. *Rep.* ii. 387.—*Selinum acaule* Cav. *Icon.* 59, t. 487, fig. 2.—*Mulinum acaule* Pers.—DC. *Prodr.* iv. 80, n. 5.

[6] *Enchir.* i. 309 (part).—Lag. *Amœn.* ii. 94.—DC. *Mém.* 32; *Prodr.* iv. 79 (part).—Endl. *Gen.* n. 4369.—B. H. *Gen.* 877, n. 15.

[7] Spec. 3, 4. Cav. *Icon.* v. t. 486, fig. 1, 2; 487, fig. 1 (*Selinum*).—Hook. *Bot. Misc.* i. t. 64.—Clos, *C. Gay Fl. Chil.* iii. 88.—Phil. *Fl. Atam.* 24.—Wedd. *Chlor. Andina*, ii. 199, t. 70, B.—Walp. *Rep.* ii. 386; *Ann.* i. 978.

[8] *Gen.* n. 1332.—L. f. *Suppl.* 435.—Thunb. *Nov. Acta Acad. Pet.* xiv. 531, t. 11, 12.—Gærtn. *Fruct.* ii. 30, t. 85.—Lamk, *Dict.* iii. 121; *Ill.* t. 851.—Lag. *Amœn.* ii. 102.—DC. *Prodr.* iv. 241.—Endl. *Gen.* n. 4530.—B. H. *Gen.* 878, n. 16.

[9] White or dark purple.

Mulinum) broadly 4-alate, crowned with styles and enlarged sepals; primary ridges 5, linear; vittæ within ridges or in mesocarp thin branched; carpophore simple. Seed flat.—Perennial herbs; leaves radical simple petiolate, more or less lanate or tomentose; umbels compound cymiform; involucral bracts ∞, sometimes foliaceous lanceolate; bracteoles of involucels 2–∞.[1] (*Cape.*[2])

82. **Asteriscium** Cham. et Schlchtl.[3]—Flowers (nearly of *Mulinum*) polygamous; sepals acute. Fruit, &c., of *Mulinum;* carpels nearly flat (*Diposis*[4]), or concave at back (*Euasteriscium*); margins thin (*Gymnophyton*[5]), or rather thick (*Bustillosia*[6]).—Glabrous herbs, sometimes with tuberous rhizome (*Diposis*); stem entirely or at base foliate (*Bustillosia*), sometimes ramose subaphyllous (*Gymnophyton*); umbels simple, ∞-flowered or more rarely (*Diposis*) compound, few-flowered; male flowers pedicellate inserted under subsessile fertile central one.[7] (*Extra trop. S. America.*[8])

83. **Huanaca** Cav.[9]—Flowers and fruit nearly of *Mulinum;* stylopods conical gradually merging in style; carpels less dilated, angular (not aliform) at margin, dorsally more or less concave. Seed at face nearly flat.—Cæspitose herbs; leaves radical petiolate, entire digitinerved (*Pozopsis*[10]) or digitately 5–7-sect, sometimes pinnatisect (*Canahua*[11]); stipules (?) scarious ciliate or glabrous; umbels, at top of simple aphyllous sometimes very elongate scape, simple or irregularly compound; bracts of involucres ∞, free. (*Extra trop. S. America, Mexico, Australia.*[12])

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[1] In central umbellule often several female flowers, in lateral oftener 1. Male flowers generally peripheric, longer-pedicellate. A gen. generally enumerated among the *Smyrneæ.*

[2] Spec. about 5. Harv. and Sond. *Fl. Cap.* ii. 565.—Walp. *Rep.* ii. 425.

[3] *Linnæa,* i. (1826) 254, t. 5.—DC. *Prodr.* iv. 82.—Endl. *Gen.* n. 4370; Suppl. iv. p. iii. 2.—B. H. *Gen.* 877, n. 14.—*Cassidocarpus* Presl. (ex DC.).—? *Dipterygia* Presl. (ex Endl.).

[4] DC. *Mém.* 33, t. 2 (1829); *Prodr.* iv. 81.—Endl. *Gen.* n. 4375; Suppl. iv. p. iii. 1.—B. H. *Gen.* 877, n. 13.

[5] Clos, *C. Gay Fl. Chil.* iii. 102, t. 32.—*Tritæmicum* Turcz. *Bull. Mosc.* (1847) i. 169.

[6] Clos, *loc. cit.* iii. 106, t. 32.—*Eremocharis* Phil. *Fl. Atamasc.* 25, t. 2 B.

[7] Sect. 3: 1. *Bustillosia;* 2. *Gymnophyton;* 3. *Diposis.*

[8] Spec. about 9. Cav. *Ic.* t. 488, fig. 2 (*Hydrocotyle*).—Cham. et Schlchtl, *Hook. Bot. Misc.* i. t. 67.—Phil. *Fl. Atamasc.* 24 (*Gymnophyton*), 25 (*Bustillosia*).—C. Gay, *Fl. Chil.* iii. 95 (*Diposis*), 99.—Walp. *Rep.* v. 848; *Ann.* i. 342, 978, 979 (*Bustillosia, Diposis*).

[9] *Icon.* vi. 18, t. 528.—DC. *Mém.* 32; *Prodr.* iv. 80.—Endl. *Gen.* n. 4373.—B. H. *Gen.* 876, n. 12.—*Triascidium* Phil.—*Lechleria* Phil. (ex *Linnæa,* xxxiii. 93, 94).

[10] Hook. *Icon.* t. 889.—*Diplaspis* Hook. f. *Hook. Lond. Journ.* vi. 469; *Fl. Tasm.* t. 34.

[11] The type of which is a Mexican plant, concerning which a few particulars are given by Bentham (*Gen.* 897) under the genus *Oreomyrrhis* (? if *H. geraniifolia* DC. *Prodr.* n. 2, to us quite unknown).

[12] Spec. 3, 4. Spreng. *Umb.* 37 (*Œnanthe*).—Lag. *Amœn.* ii. 93 (*Spananthe*).—Benth. *Fl. Austral.* iii. 366 (*Diplaspis*).—Walp. *Ann.* i. 341 (*Diplaspis*).

84. **Bowlesia** R. et Pav.[1]—Flowers [2] polygamous; sepals conspicuous dentiform. Petals 5, entire obtuse, sometimes aculeate at back (*Drusa* [3]). Stamens inserted under conical stylopods confluent at base with short styles; anthers often 2-dymous. Fruit much compressed at commissure; carpels transversely 3-angular, flat or rather concave at back; intrajugal vittæ thin or 0; carpophore simple. Primary dorsal ridges thin; intermediate marginal at angles of mericarps; lateral in face near commissure thin. Seed compressed back and front.—Herbs glabrous or oftener with stellate pubescence, sometimes armed with barbed hairs or spines (*Drusa*); leaves digitinerved, cuneate or lobed, alternate or partly opposite; stipules foliaceous small or reduced to ciliate scales (*Homalocarpus* [4]); umbels in dichotomy simple or irregularly compound; bracts of involucres small few or 0. (*South And. and Mexican America, Canaries.*[5])

85. **Eryngium** T.[6]—Flowers [7] hermaphrodite or 1-sexual; sepals expanded rigid, acute or sharp-pointed, or covered with scales (often coloured). Petals erect or connivent emarginate; costa intruded; point long induplicate; more or less imbricate. Styles slender, girt at base with lobes of epigynous disk (stylopods) various in form and oftener depressed. Fruit ovoid or obovoid, not or slightly compressed; commissure broad; mericarps semiterete, externally smooth or aculeate; carpophore 0; primary ridges subequal, inconspicuous or very little prominent; intrajugal vittæ thin or between the ridges very thin, irregularly reticulate or 0. Seed subterete or compressed, at face flat or rather concave.—Herbs shrubs or small trees, generally glabrous, sometimes spinescent; leaves entire, ciliate or oftener spinous-dentate or lobed, sometimes grasslike or wider straight-nerved;

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[1] *Prodr.* 44, t. 34; *Pl. Per. et Chil.* iii. 28 (not Poir.).—Spreng. *Umb.* 24.—Lag. *Amœn.* ii. 94.—Koch, *Umb.* 142.—DC. *Mém.* 31; *Prodr.* iv. 75.—Endl. *Gen.* n. 4365.—B. H. *Gen.* 876, n. 10.

[2] White or purple, sometimes very dark.

[3] DC. *Ann. Mus.* x. 466, t. 38; *Prodr.* iv. 80.—Spreng. *Umb.* 15, fig. 6.—Lag. *Amœn.* ii. 94.—Endl. *Gen.* n. 4372.

[4] Hook. and Arn. *Bot. Misc.* iii. 348.—Endl. *Gen.* n. 4374.—? *Elsneria* Walp. *Pl. Meyen.* 346, t. 8 (ex B. H.).

[5] Spec. 10-12. Poir. *Dict.* vii. 155, n. 5 (*Sicyos*).—Link et Ott. *Ic. Pl. Rar.* t. 4.—Colla, *Pl. Rar. Chil.* t. 19.—A. Rich. *Ann. Sc. Phys.* iv. 160, t. 51, fig. 3.—Hook. *Fl. Ind.* ii. 669.—Clos, *C. Gay Fl. Chil.* iii. 70, 92, t. 30 (*Homalocarpus*).—Wedd. *Chlor. Andina*, ii. 187, t. 67, B.—Parlat. *Webb Phyt. Canar.* t. 78 (*Drusa*).—Walp. *Rep.* ii. 386; v. 842, 843 (*Homalocarpus*); *Ann.* i. 341, 977.

[6] *Inst.* 327, t. 173.—L. *Gen.* n. 324.—J. *Gen.* 226.—Gærtn. *Fruct.* i. 77, t. 20.—J. *Gen.* 226.—Lamk. *Dict.* iv. 751; Suppl. iv. 287; *Ill.* t. 187.—Laroche, *Hist. Eryng.* (Paris, 1808, infol.).—Lag. *Amœn.* ii. 105.—Koch, *Umb.* 139.—DC. *Prodr.* iv. 87.—Endl. *Gen.* n. 4386.—B. H. *Gen.* 878, n. 17.—*Lessonia* Bert. *Deless. Ic. Sel.* iii. 45, t. 78.—*Strebanthus* Rafin. *Ser. Bull. Bot.* i. 218 (ex Endl.).

[7] White, bluish or purplish.

flowers in more or less elongate spikes or capitate; each 1-bracteate; lower bracts smaller than the rest or oftener larger entire or lobed and forming a more or less developed involucre, more rarely (*Alepidea* [1]) very small under the flowers, irregularly disposed or 0. (*All warm and temp. regions.*[2])

86. **Astrantia** T.[3]—Flowers [4] polygamous; sepals dentiform or petaloid, sometimes very acute. Petals imbricate or valvate, from intruded costa emarginate; point long-induplicate. Styles slender free; stylopods dilated to a short thick disk. Fruit ovoid or oblong, either subterete, somewhat compressed at back (*Euastrantia*), or slightly compressed contrary to septum (*Hacquetia* [5]); carpophore 0. Primary ridges subequal smooth (*Hacquetia*), or oftener (*Euastrantia, Actinolema* [6]) raised and transversely plicate-dentate, rugose or lobed, not separable from endocarp (*Actinolema* [6]) or loosely inflated and separable (*Euastrantia*). Intrajugal vittæ generally solitary. Seed flat or concave.—Glabrous herbs; subterranean part often tuberose; scapes simple leafless (*Hacquetia*), or with branched stem; leaves palmately lobed or dissected; lobes dentate or incised; umbels (?) simple or irregularly compound, sessile (*Actinolema*), or pedunculate; bracteoles of involucres ∞, green (*Hacquetia*) or coloured; inflorescences umbelliform;[7] male flowers longer-pedicellate; some oftener disposed around a female flower sometimes central. (*Europe, Levant.*[8])

87. **Sanicula** T.[9]—Flowers polygamous or monœcious; sepals

[1] Laroche, *Hist. Eryng.* 19, t. 1.—DC. *Prodr.* iv. 87.—Endl. *Gen.* n. 4385.—B. H. *Gen.* 878, n. 18.

[2] Jacq. *Fl. Austr.* t. 391; *Ic. Rar.* t. 55, 347.—Cav. *Icon.* t. 552–556.—Labill. *N.-Holl.* t. 98.—Desf. *Fl. Atl.* t. 53–55.—Reichb. f. *Ic. Fl. Germ.* t. 1847–1852.—Sibth. *Fl. Græc.* t. 258, 259.—Wedd. *Chlor. Andina*, t. 69, A.—Hook. *Icon.* t. 216.—A. Gray, *Man.* (ed. 5) 190.—Chapm. *Fl. S. Un.-St.* 159.—Hook. f. *Handb. N. Zeal. Fl.* 90.—Phil. *Fl. Atamasc.* 25.—Clos, *C. Gay Fl. Chil.* iii. 110.—Benth. *Fl. Austral.* iii. 369.—Harv. and Sond. *Fl. Cap.* ii. 533 (*Alepidea*).—Hiern, *Oliv. Fl. Trop. Afr.* iii. 2, 3 (*Alepidea*).—Boiss. *Diagn. Or.* ser. 2, ii. 72; v. 97; *Fl. Or.* ii. 820.—Gren. et Godr. *Fl. de Fr.* i. 753.—Walp. *Rep.* ii. 389; v. 845; *Ann.* i. 343, 979; ii. 694; v. 64.

[3] *Inst.* 314, t. 166.—L. *Gen.* n. 327.—Lamk. *Dict.* i. 322; *Ill.* t. 191.—Lag. *Amœn.* ii. 97.—Koch, *Umb.* 138.—DC. *Prodr.* iv. 86.—Spach, *Suit. à Buffon*, viii. 216.—Endl. *Gen.* n. 4384.—B. H. *Gen.* 879, n. 20.

[4] White or pink.

[5] Neck. *Elem.* n. 306.—DC. *Prodr.* iv. 85.—Endl. *Gen.* n. 4383.—B. H. *Gen.* 879, n. 21.—*Dondia* Spreng. *Mém. Mosc.* v. 8; *Umb. Prodr.* 21, fig. 2.—Koch, *Umb.* 140.—DC. *Prodr.* iv. 85.—Endl. *Gen.* n. 4384.—B. H. *Gen.* 879, n. 21.—*Dondisia* Reichb. *Consp.* 144 (not DC.).

[6] Fenzl. *Pug. Pl. Syr.* 66, t. 12.—Boiss. *Fl. Or.* ii. 831.

[7] Concerning the centrifugal nature of the younger inflorescence cf. H. Bn. *Adansonia*, xii. 178. Flowers in inflorescence here and there surrounded by some sterile.

[8] Spec. about 5. Jacq. *Fl. Austr.* v. t. add. 11 (*Hacquetia*).—Reichb. f. *Ic. Fl. Germ.* t. 1842 (*Hacquetia*), 1843–1846.—Sm. *Exot. Bot.* ii. t. 76, 77.—Salisb. *Par.* t. 60.—Boiss. *Fl. Or.* ii. 830.—Gren. et Godr. *Fl. de Fr.* i. 752.—Walp. *Rep.* ii. 388; v. 845 (*Actinolema*); *Ann.* v. 64.

[9] *Inst.* 326, t. 173.—L. *Gen.* n. 326.—J. *Gen.* 225.—Hoffm. *Prodr. Umb.* 65.—Spreng. *Prodr. Umb.* 24.—DC. *Prodr.* iv. 84.—Endl. *Gen.* n. 4382.—B. H. *Gen.* 880, n. 22.

dentiform or membranous. Petals 5, long-induplicate-acuminate, emarginate from intruded costa, subvalvate or imbricate. Germen generally echinulate; styles at base thin or slightly incrassate; stylopods disklike flattened. Fruit ovoid or oblong, prickly with straight generally barbed points, subterete or rather compressed laterally; commissure rather flat, slightly constricted or broad; ridges scarcely conspicuous; vittæ ∞; intrajugal little conspicuous or 0; carpophore 0; seed transversely semiterete or subterete, at face flat or slightly convex.—Herbs oftener low and perennial; leaves alternate, sometimes rosulate, generally palmati-3–5-sect; segments dentate-lobed or pinnate-dissected; flowers in (spurous ?) sub-2-chotomous or few-rayed, sometimes irregularly compound umbels; bracts of involucre often leaflike dentate-lobed; bracteoles small or sometimes (*Erythrosana*[1]) wide rayed; umbellules 1, 2-sexual.[2] (*Europe, temp. Asia, cold and temp. Americas, Sandwich Is.*[3])

88. **Arctopus** L.[4]—Flowers[5] diœcious; receptacle of males small. Sepals and petals 5; stellately rayed, pointed. Disk (?) central flat. Stamens 5; filaments inserted under disk elongate incurved; anthers short. Styles 2 rudimentary in centre of flower. Receptacle of female flower tubular, attenuate in a neck, dilated above and there bearing 5 narrow sepals and petals. Germen inferior, adnate to receptacle; one cell often sterile rudimentary; the other 1-ovulate; ovule anatropous descending. Styles 2 erect, long-conical, enlarged externally to a short stylopod. Primary and sometimes secondary ridges rigidly prominent, either naked, or setose, spinescent or muricate; intrajugal vittæ thin or 0.—Perennial herbs; leaves adpressed to ground suborbicular or subflavellate, spinose-dentate or setose; petiole more or less dilated; umbels on short or sub-0 stem ∞, stipitate;[6] male flowers pedicellate and girt with ∞ non-accrescent bracts; female few in roundish involucre, finally enlarged and adnate to base of fruit. (*Cape.*[7])

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[1] The type of which is *S. rubriflora* F. Schm. (*Maxim. Prim. Fl. Amur.* 123) unknown to us.

[2] Flowers pink or whitish.

[3] Spec. 8–10. Jacq. *Icon. Rar.* ii. t. 348.—Reichb. *Ic. Fl. Germ.* t. 1847.—Coll. *Pl. Ror. Chil.* t. 20.—Hook. *Fl. Bor.-Amer.* t. 90–92.—Seub. *Fl. Azor.* t. 15.—Wight, *Icon.* t. 334, 1004.—Cl. *C. Gay Fl. Chil.* iii. 108.—A. Gray, *U. S. Expl. Exp. Bot.* i. t. 88.—Torr. *Fl. N.-York*, i. t. 31, 32.—Boiss. *Fl. Or.* ii. 832.—Gren. et Godr. *Fl. de Fr.* i. 757.—Walp. *Rep.* ii. 387; v. 845; *Ann.* v. 63.

[4] *Hort. Cliff.* 495; *Gen.* n. 1165.—Poir. *Dict.* iv. 674; *Ill.* t. 865.—Gærtn. *Fruct.* iii. 14, t. 182.—DC. *Prodr.* iv. 236.—Endl. *Gen.* n. 4521.—B. H. *Gen.* 879, n. 19.—H. Bn. *Dict. Encycl. Sc. Méd.* vi. 38.—*Apradus* Adans. *Fam. des Pl.* ii. 102.

[5] "White."

[6] Whence they appear compound.

[7] Spec. 3. Thunb. *Fl. Cap.* 255.—Lindl. *Bot. Reg.* t. 705.—Harv. and Sond. *Fl. Cap.* ii. 564.

89. **Actinotus** Labill.[1]—Flowers polygamous; calyx subcampanulate or nearly flat; teeth 5, sometimes very short or 0. Petals entire, imbricate or sometimes 0. Styles at base enlarged to oftener dorsal stylopods. Germen inferior, 1-locular, 1-ovulate; style from base 2-partite or 2-fid. Fruit[2] unsymmetrical, unequally ovoid, sometimes convex, 2-costate, at others nearly flat, 1-costate; margins costate; intrajugal vittæ thin or 0. Seed subterete, at face less convex than at back.—Branched or sometimes (*Hemiphues*[3]) cæspitose herbs; leaves dentate, lobed or oftener 3-nato-dissected; scape sometimes leafless (*Hemiphues*); umbels simple; bracts of involucres rayed green or subpetaloid, sometimes much evolute, coloured, tomentose or lanate. (*Australia.*[4])

90. **Petagnia** Guss.[5]—Flowers polygamous; receptacle of fertile ovoid or subpyramidal, enclosing adnate germen. Sepals 5, lanceolate, inserted at mouth of receptacle. Petals 5, alternate, subequal, attenuate at base to a claw, at apex produced in a long induplicate point, spuriously 2-lobed from costa impressed above. Styles 2, slender, recurved, surrounded at base by depressed crenate disk (stylopod). Germen 1-celled; ovule 1, subapical pendulous. Fruit dry ovoid costato-subpyramidal subcrustaceous, indehiscent; costæ 2 thicker; others very thin.—A glabrous perennial herb;[6] leaves palmatipartite; lobes serrulate or incised; flowers[7] in repeated 2-chotomous cymes (?); fertile sessile in dichotomy; pedicels few (oftener 2, 3) of male flowers (or more rarely of female) springing from the middle of the receptacular costæ. (*Sicily.*[8])

91. **Lagoecia** L.[9]—Flowers[10] hermaphrodite; receptacle elongate unequally lageniform. Sepals 5, long-aristate-dentate. Petals 5, shorter subovate; point inflexed; margins reflexed spuriously 2-lobed; costa intruded above. Germen unsymmetrical,[11] 1-celled, adnate within to cavity of receptacle; one cell (anterior) effete or inconspicuous.

[1] *Pl. N.-Holl.* i. 67, t. 92.—R. Br. *Flind. Voy.* ii. 557.—DC. *Prodr.* iv. 83.—Endl. *Gen.* n. 4378.—B. H. *Gen.* 880, n. 24.—*Eriocalyx* Sm. *Exot. Bot.* t. 78, 79.—*Proustia* Lag. (ex DC.).

[2] Glabrous or sericeous.

[3] Hook. f. *Hook. Lond. Journ.* vi. 469; *Fl. Tasm.* t. 36.

[4] Spec. 7. Hook. *Icon.* t. 847.—Lindl. *Bot. Reg.* t. 654.—Benth. *Hueg. Enum.* 56; *Fl. Austral.* iii. 367.

[5] *Prodr. Fl. Sicul.* i. 311.—DC. *Mém. Omb.* 35; *Prodr.* iv. 83.—Endl. *Gen.* n. 4380.—B. H. *Gen.* 881, n. 26.—H. Bn. *Bull. Soc. Linn. Par.* 173.—*Heterosciadium* DC. (ex ips. *Prodr. loc. cit.*).

[6] Habit of *Sanicula*.

[7] Inflorescence nearly of *Caryophylleæ*.

[8] Spec. 1. *P. saniculæfolia* Guss. — *Sison Gussonianum* Balb.—*S. Gussonii* Spreng. *Syst. Cur. Post.* (ex DC.).

[9] *Gen.* n. 285.—Adans. *Fam. des Pl.* ii. 102.—Gærtn. *Fruct.* i. 103, t. 23, fig. 3.—Lag. *Amœn.* ii. 106.—DC. *Prodr.* iv. 233.—Endl. *Gen.* n. 4518.—B. H. *Gen.* 880, n. 25.—H. Bn. *Bull. Soc. Linn. Par.* 135.—*Cuminoides* T. *Inst.* 300, t. 155.

[10] White, small.

[11] Posteriorly gibbous and there setose.

Style 1, superposed to sterile cell, slightly capitellate at stigmatose apex; disk epigynous (stylopod) unequally 2-lobed; anterior lobe much larger. Ovule in fertile cell 1, descending; micropyle extrorsely superior.[1] Fruit oblong-ovoid, crowned with sepals, evittate. Face of seed nearly flat or rather convex.—Glabrous annuals; stem simple or slightly branched; leaves few pinnate; segments thin pinnatifid; flowers in dense globose simple branched umbels; bracts of involucres conformed to leaves pectinate-pinnatifid; pedicels under calyx surrounded by 4–5 bracts, alternating with and conformed to sepals. (*Medit. reg., Levant.*[2])

VI. ARALIEÆ.

92. **Aralia** T.—Flowers hermaphrodite or polygamous (*Dimorphanthus*), 5-merous or more rarely 8–10-merous (*Sciadodendron*); receptacle concave turbinate or deeply cupular. Calyx small, entire or consisting of free dentiform sepals, sometimes 0. Petals inserted at margin of receptacle, sessile, or valvate, or more or less imbricate (*Euaralia, Dimorphanthus, Pentapanax, Acanthopanax, Eleutherococcus, Brassaiopsis*). Stamens equal in number to and alternating with petals, inserted under depressed or convex epigynous disk; filaments oftener inflexed; anthers introrse dorsifixed, 2-rimose. Germen adnate to receptacle or free only at disciferous apex; cells equal in number and superposed to petals, or 2, 3 (*Aureliana, Brassaiopsis, Macropanax*); style short or rather long, subentire or more or less deeply lobed or branched. Ovule in adult cells 1, descending from top of internal angle, anatropous; micropyle extrorsely superior; raphe ventral; funicle short or rather long, sometimes thickened above micropyle to obturator. Fruit drupaceous; pyrenes 2–5 or more rarely 6–10, smooth, rugose or costate. Seed in pyrenes solitary descending; albumen fleshy, uniform or more rarely rugose or ruminate (*Macropanax, Brassaiopsis*); embryo subapical minute.—Trees shrubs or perennial herbs, glabrous, pubescent, setose or aculeate; hairs short simple or more rarely stellate; leaves alternate digitate or pinnate, rarely simple, palmatifid or lobed; stipules small or sometimes long projecting from base or sides of petiole; flowers in simple or compound umbels, sometimes more or less congested in a raceme;

[1] Integument simple very short.

[2] Spec. 1. *L. cuminoides* L.—Sibth. *Fl. Græc.* t. 243.—Lamk. *Dict.* iii. 376; *Ill.* t. 142.—Boiss. *Fl. Or.* ii. 832.

pedicels not articulate or subarticulate at apex, most frequently clearly articulate. (*All warm and temp. regions.*)—See p. 151.

93? **Aralidium** Miq.[1]—Flowers polygamo-diœcious (?); calyx short, 5-lobed. Petals 5, imbricate[2] (or subvalvate?). Stamens 5; anthers short. Disk central rather thick. Female flower...? "Fruit[3] oblong-fusiform, crowned with 3–4 sessile stigmas, 1-pyrenous; putamen rather hard; exocarp thin; seed pendulous."—A glabrous shrub; leaves[4] alternate, irregularly dentate or pinnatifid; stipules little prominent; flowers[5] in full very ramose cymiferous raceme; bracts minute. (*Malaya, Ind. Archip.*[6])

94. **Cœmansia** March.[7]—A new genus of *Araliaceæ*, apparently near *Sciadodendron*.

95. **Myodocarpus** Br. and Gr.[8]—Flowers nearly of *Aralia;* sepals 5 imbricate or valvate. Petals sessile,[9] imbricate. Stamens 5, inserted under depressed epigynous disk; anthers short. Germen inferior, styles 2, capitellate or acute at apex, angular below apex. Fruit obovate, compressed contrary to septum, crowned with sepals, produced below to 2 broad, dorsal relative to carpels, descending, reticulate veined wings; pericarp thin internally full of prominent resiniferous vesicules penetrating the seed; mericarps separable at maturity, 1-alate. Seed descending; albumen hard;[10] embryo subapical minute.—Glabrous trees or shrubs; leaves alternate, simple or pinnate; stipules adnate to petiole, little prominent; flowers in compound umbelliferous racemes; bracts small few; pedicel articulate under flower. (*N. Caledonia.*[11])

96. **Delarbrea** Vieill.[12]—Flowers[13] nearly of *Myodocarpus;* sepals rather broad, imbricate. Petals broad at base or somewhat narrowed, imbricate. Stamens and germen of *Myodocarpus;* disk epigynous broadly conical. Styles 2, erect subclavate, apex obtuse stigmatose. Fruit ovoideo-subcompressed subdrupaceous, obtusely costate; sarcocarp filled with oleaginous vesicules; putamens 2. Seed dorsally compressed; at face concave or sulcate.—Shrubs;

[1] *Fl. Ind.-Bat.* i. p. 1, 762, t. 13; Suppl. 340.—B.H. *Gen.* 936, n. 6.

[2] They seem scarcely imbricate.

[3] Rather large ("an inch").

[4] Large, elongate.

[5] Minute, crowded.

[6] Spec. 1. *A. pinnatifidum* Miq. *loc. cit.*

[7] *Bull. Acad. Roy. Belg.* ser. 2, xlvii. n. 1.

[8] *Bull. Soc. Bot. Fr.* viii. 123 (1861); *Ann. Sc. Nat.* ser. 5, i. 379; iii. 232; *Nouv. Arch. Mus.* iv. 38, t. 15.—B. H. *Gen.* 934, n. 1.—H. Bn. *Adansonia*, xii. 130.

[9] "At base broad affixed" (B. H.).

[10] Except the vesicules mentioned above, uniform.

[11] Spec. 4–6.

[12] *Bull. Soc. Linn. Norm.* ix. 342, 393.—Br. et Gr. *Ann. Sc. Nat.* ser. 5, iii. 233.—B. H. *Gen.* 935, n. 2.

[13] "White."

leaves alternate, collected at top of twigs, imparipinnate; stipules internally adnate to petiole and little prominent; inflorescence, &c., of *Myodocarpus;* pedicels articulate under flower and there sometimes dilated. (*N. Caledonia.*[1])

97 ? **Pseudosciadium** H. Bn.[2]—Flowers[3] polygamous (nearly of *Delarbrea*); calyx gamosepalous, 5-fid. Petals 5, concave, attenuate at base, carinate within, valvate.[4] Styles at base confluent with thick epigynous disk, 2-morphous, short in male flower, in female long subclavate recurved, revolute at pointed apex, stigmatose within and at apex. Fruit (very immature) ovoid slightly compressed glabrous exalate.—A shrub; stem subsimple; leaves collected at apex of stem or branches imparipinnate; petiole long, dilated at base to a ring (stipular ?); flowers in a very long compound ramose-umbelluliferous raceme; pedicels articulated far from flower.[5] (*N. Caledonia.*[6])

98. **Mackinlaya** F. Muell.[7] — Flowers[8] polygamous; sepals acute. Petals[9] unguiculate, carinate within, produced to long induplicate point, valvate. Styles erect, finally recurved, seated upon a depressed epigynous disk undulately lobed at margin. Fruit[10] much compressed contrary to septum, orbicularly sub-2-dymous, cordato- or renato-rotundate, drupaceous; pyrenes 2, rather hard cartilaginous much compressed. Seed ("bluish") conformed; albumen uniform subhorny; embryo very small subapical.—A small glabrous shrub; leaves alternate digitate; leaflets with few teeth; "stipules membranous adnate to rather long petiole;" flowers in decompound umbel; bracts short linear; pedicels (at least in age glabrous) articulate under flower.[11] (*Trop. east. Australia.*[12])

99. **Apiopetalum** H. Bn.[13]—Flowers[14] oftener hermaphrodite; receptacle obconical, nearly enclosing adnate germen. Sepals 5, narrow. Petals[15] alternate 5, unguiculate, inflexed at acute apex,

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[1] Spec. about 3. H. Bn. *Adansonia*, xii. 130.

[2] *Adansonia*, xii. 131.

[3] Greenish white, minute.

[4] White (quite of some true *Umbelliferæ*, whence generic name).

[5] A genus which, when the fruit is better known, will perhaps become a sect. of *Delarbrea* or *Myodocarpus*, as yet, from the nature of its petals, styles and young fruit, it is distinct enough from both and very closely connects the true *Umbelliferæ* with the *Araliæ*.

[6] Spec. 1. *P. Balansæ* H. Bn.

[7] *Fragm. Phyt. Austral.* iv. 120.—B. H. *Gen.* 937, n. 7.—H. Bn. *Adansonia*, xii. 131, 133.

[8] Small, "yellow, glabrous."

[9] Of the *Umbelliferæ*.

[10] "Darkening from blue."

[11] A genus apparently very near *Pseudosciadium;* petals the same; but differing chiefly by digitate leaves and nature of disk.

[12] Spec. 1. *M. macrosciadea* F. Muell.—Benth. *Fl. Austral.* iii. 383.—*Panax macrosciadeus* F. Muell. *Fragm.* ii. 108, 176.

[13] *Adansonia*, xii. 133.

[14] Greenish or yellowish.

[15] Of the *Umbelliferæ*.

ciliate at margin. Stamens 5; filaments inflexed at apex, inserted under conical epigynous disk crowning apex of germen and produced above to 2-4 subulate styles.[1] Germen mostly inferior, 2–4-celled; ovule in cells 1, descending; micropyle extrorsely superior. Fruit drupaceous oblong (immature); pyrenes 1–4, woody, sulcate. Seed conformed to putamen; embryo . . . ?—Glabrous or velvety shrubs; leaves alternate, sometimes collected at top of branches, petiolate, simple oblong-lanceolate or subspathulate dentate; flowers in long-stipitate compound-umbelluliferous corymbs; bracts of involucels ∞.[2] (*N. Caledonia.*[3])

100. **Astrotricha** DC.[4]—Flowers[5] asepalous or sepals short dentiform. Petals 5, coriaceous, valvate. Stamens 5 (of *Aralia*); filaments inserted under subplane or cupular disk undulate at margin. Germen inferior, 2-celled; styles free slender. Fruit ovoid, compressed contrary to septum; exocarp thin; pyrenes 2, sometimes spuriously hollowed in cellules; albumen of descending seed uniform. —Shrubs woolly or stellately tomentose in every part; leaves alternate petiolate simple; umbellules in very ramose racemes; bracts small or 0; pedicels articulate under flower. (*Australia.*[6])

101. **Horsfieldia** Bl.[7]—Flowers (nearly of *Astrotricha*) oftener hermaphrodite; calyx short or 0. Petals glabrous, valvate. Germen 2-celled; styles 2, free, perceptibly dilated at base to stylopods. Fruit ovoid laterally compressed; carpels separable at maturity, 3-costate; albumen of oblong seed uniform.—Tall aculeate, tomentose or woolly shrubs; leaves alternate petiolate, peltate or cordate, 3–5-lobed or palmati-3–9-fid; umbellules small capituliform in long compound-ramose raceme; bracts small; the exterior larger membranous imbricate; pedicels inarticulate, often bracteolate. (*Java.*[8])

102. **Schefflera** Forst.[9]—Flowers[10] hermaphrodite or polygamous; calyx dentate or entire, sometimes very short or 0. Petals 4–5, or more rarely ∞, valvate, either separate (*Heptapleurum*,[11] *Euschefflera*),

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[1] Anthers nestling in concave petals.

[2] Appearance quite singular. For the plant in a species clothed with leaves resembles *Broussaisia.*

[3] Spec. 2. H. Bn. *loc. cit.* 134.

[4] *Mém.* 29, t. 5, 6; *Prodr.* iv. 74.—Endl. *Gen.* n. 4363.—B. H. *Gen.* 937, n. 9.—Seem. *Journ. Bot.* v. 237.

[5] Everywhere stellately tomentose.

[6] Spec. 3, 4. Benth. *Fl. Austral.* iii. 379.—Walp. *Rep.* ii. 385.

[7] *Bijdr.* 885.—DC. *Prodr.* iv. 87.—Endl. *Gen.* n. 4387; Suppl. i. 1413.—B. H. *Gen.* 937, n. 8.—Seem. *Journ. Bot.* v. 237 (part).—*Schubertia* Bl. *Bijdr.* 884.

[8] Spec. 2. Benn. *Pl. Jav. Rar.* 123, t. 26.

[9] *Char. Gen.* (1776) 45, t. 23.—J. *Gen.* 429.—Seem. *Journ. Bot.* iii. 175.—B. H. *Gen.* 940, n. 18.—H. Bn. *Adansonia*, xii. 138, 145.

[10] White, yellow or purplish.

[11] Gærtn. *Fruct.* ii. 472, t. 178, fig. 3 (1791).—Seem. *Journ. Bot.* iii. 75.—B. H. *Gen.* 942, n. 23.

or more or less combined and subcalyptrately deciduous; apex oftener inflexed and pendulous from the top of the bud among the anthers. Stamens equal in number to petals and inserted with them under a flat, depressed or conical, sometimes elongate (*Actinomorphe*[1]) epigynous disk. Germen inferior or free at apex; cells 4–5, oppositipetalous or more rarely 2–3 (*Dipanax*,[2] *Meiopanax*[3]), or 3–∞, 5–10 (*Euschefflera*), 6–∞ (*Brassaia*,[4] *Paratropia*); styles either free at base, obtuse at apex, or capitellate, or connate to greater or less height (*Astropanax*,[5] *Dendropanax*,[6]) or nearly to apex (*Agalma*[7]), sometimes very short or scarcely perceptible (*Meiopanax*, *Dipanax*, *Paratropia*), sometimes in the same species (*Euschefflera*) either very short obtuse, or finally elongate capitellate. Ovules in cells solitary, descending; micropyle extrorsely superior, sometimes closed by thickened funicle. Fruit drupaceous; pyrenes 2–∞; albumen of descending seed uniform or rarely (*Dendropanax*) rugose.—Trees or shrubs sometimes climbing; leaves alternate or rarely in part opposite, simple or 1-foliolate, entire or palmatilobed, oftener ∞-foliolate digitate or rarely (*Dipanax*) pinnate; flowers umbellulate or capitate; capitules or umbellules in racemes or corymbs more or less branched, sometimes very elongate; bracts small or more rarely (*Brassaia*) broad and forming an involucel more or less deeply cupular under each flower; pedicels inarticulate. (*All trop. and subtrop. regions.*[8])

103? **Sciadophyllum** P. Br.[9]—Flowers nearly[10] of *Schefflera*;

—Hook. *Fl. Ind.* ii. 727.—*Paratropia* DC. *Prodr.* iv. 265 (part).—Endl. *Gen.* n. 4561.—Dcne. et Pl. *Rev. Hort.* (1854) 100.

[1] Miq. *Comm. Phyt.* 102; *Fl. Ind.-Bat.* i. p. i. 749.

[2] Seem. *Journ. Bot.* vi. 130.

[3] H. Bn. *Adansonia*, xii. 147.

[4] Endl. *Nov. St. Dec.* 89; *Iconogr.* t. 114–116; *Gen.* n. 4556[1].—Seem. *Journ. Bot.* ii. 242.—B. H. *Gen.* 943, n. 25.—Hook. *Fl. Ind.* ii. 732.

[5] Seem. *Journ. Bot.* iii. 176, 225.

[6] Dcne. et Pl. *Rev. Hort.* (1854) 107.—Seem. *Journ. Bot.* ii. 299.—B. H. *Gen.* 943, n. 26.—Hook. *Fl. Ind.* ii. 733.—*Textoria* Miq. *Ann. Mus. Lugd.-Bat.* i. 12 (Rather perhaps a sect. of *Sciadophyllum* than of *Schefflera*, genera in other respects very closely allied and better perhaps united in one).

[7] Miq. *Fl. Ind.-Bat.* i. p. i. 751, t. 11.

[8] Spec. about 90. Jacq. *Hort. Schœnbr.* t. 51 (*Aralia*).—Wight, *Icon.* t. 1011–1015 (*Hedera*).—Hook. f. *Fl. N.-Zeal.* t. 22 (*Aralia*); *Handb. N. Zeal. Fl.* 103 (*Schefflera*).—A. Gray, *Un. St. Expl. Exp. Bot.* i. 715, t. 89 (*Aralia*); 722 (*Paratropia*).—Miq. *Fl. Ind.-Bat.* i. p. i. 749 (*Actinomorphe*), 751, t. 11 (*Agalma*), 752, t. 12 (*Paratropia*); *Ann. Mus. Lugd.-Bat.* ii. 12 (*Textoria*), 19, 219 (*Paratropia*), 25 (*Agalma*), 26 (*Dendropanax*).—Benth. *Fl. Austral.* iii. 384 (*Heptapleurum*), 385 (*Brassaia*).—Fr. et Sav. *Enum. Pl. Jap.* i. 194.—Hiern. *Oliv. Fl. Trop. Afr.* iii. 29 (*Heptapleurum*).—Harv. and Sond. *Fl. Cap.* ii. 570 (*Cussonia*).—Hance, *Journ. Bot.* (1877) 334 (*Heptapleurum*).—Walp. *Rep.* ii. 433 (*Paratropia*); *Ann.* i. 359 (*Paratropia*); ii. 724 (*Paratropia*).

[9] *Jam.* 190, t. 19 (1756).—J. *Gen.* 451 (*Sciodaphyllum*).—DC. *Prodr.* iv. 259.—Endl. *Gen.* n. 4559 (part).—Dcne. et Pl. *Rev. Hort.* (1854) 106.—Seem. *Journ. Bot.* iii. 265 (part); vi. 141.—B. H. *Gen.* 940, n. 17.—H. Bn. *Adansonia*, xii. 146.—*Actinophyllum* R. et Pav. *Prodr.* 51, t. 8; *Fl. Per.* iii. 74, t. 307–311.

[10] White or yellowish, sometimes handsome, hermaphrodite or sometimes polygamous.

receptacle rather thick obconical or subovoid. Calyx short, entire at margin, truncate or crenato-dentate or sinuate. Petals 4–6, generally united in circumscissously deciduous hood, sometimes free at base, rather thick, valvate. Stamens 4–10; filaments inserted under epigynous disk, incurved or inflexed; anthers introrse dorsifixed, oftener reniform-recurved, 2-rimose. Germen adnate to receptacle, inferior or free only at apex, flat or convex above, 3–10-celled; style branches generally distinct from base, more rarely connate to middle, linear erect, or subulate recurved; ovule in cells 1, descending; funicle sometimes dilated covering micropyle. Fruit subglobose, obovoid or on drying angular drupaceous; pyrenes 3–10, thick or crustaceous; albumen of laterally compressed seeds uniform.—Trees or shrubs, glabrous or covered with adpressed stellulate pubescence; leaves digitately compound or very rarely 1-foliolate; folioles generally entire; stipules interior to petiole often elongate; flowers in simple or compound or corymbose umbelluliferous or capituliferous racemes, variously bracteate, inarticulate.[1] (*Trop. America.*[2])

104? **Osmoxylon** Miq.[3] — Flowers polygamous; calyx small truncate or undulate. Petals 4–5, valvate and alternate with as many stamens; anthers ovate-oblong; filaments inflexed to apex. Disk thin. Germen 4–5- or 10-celled; styles very short.[4] Fruit drupaceous globose; pyrenes 1-spermous; albumen of descending seed uniform?—Glabrous trees; leaves entire, palmatilobed or ∞-digitate; stipules connate in entire or lacerate layer within petiole; flowers in compound or decompound umbels, capitate at top of pedicels or umbellulate on "very short continuous pedicels"; bracts 1–3 squamiform under flower, sometimes persistent under fruit, entire or lacerate.[5] (*Ind. Archip.*[6])

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[1] A gen. perhaps better reduced to a sect. of *Sciefflera*, scarcely distinct from the Old World *Heptapleura* (often described under *Sciadophyllum*), preserved here chiefly on account of its American origin. *Astropanax* (a sect. of *Schefflera*) is syn. (ex Seem.).

[2] Spec. about 20. L. *Mantiss.* 212 (*Vitis*).—Sw. *Prodr.* 55 (*Aralia*); *Fl. Ind. Occ.* i. 519 (*Hedera*).—B. H. K. *Nov. Gen. et Sp.* v. 8, t. 417 (*Aralia*).—Poir. *Dict.* vi. 758.—Pl. et Lind. *Aral.* 23.

[3] *Ann. Mus. Lugd.-Bat.* i. 5.—Seem. *Journ. Bot.* iii. 75.—B. H. *Gen.* 944, n. 28.

[4] As in some *Scheffleras*.

[5] Gen. imperfectly known; whether rather a sect. of *Schefflera* or *Heptafleurum*? But form of perianth seems very different.

[6] Spec. 2, 3. Rumph. *Herb. Amb.* ii. 54, t. 12 (*Pseudo-Santalum*). — Buch. *Decad.* i. t. 9 (*Pseudo-Santalum*).—Lamk. *Dict.* i. 225 (*Aralia*). —DC. *Prodr.* iv. 262, n. 5 (*Hedera*).—Roxb. *Fl. Ind.* i. 408 (*Gastonia*)?

105? **Didymopanax** Dcne. and Pl.[1]—Flowers hermaphrodite;[2] calyx small dentate. Petals valvate. Disk epigynous flat or concave, undulate at margin. Germen 2-celled; styles 2, free, sulcate within. Ovules descending; funicle short, sometimes thickened to obturator. Fruit drupaceous, much compressed contrary to septum, broadly sub-2-dymous; sarcocarp thin; pyrenes much compressed, crustaceous or cartilaginous; albumen of flat seed uniform.—Trees or shrubs, sericeous or velvety, more rarely glabrous; leaves simple or oftener digitate; folioles petiolulate; stipules small adnate to petiole; umbellules (sometimes racemiform) in compound racemes; pedicels inarticulate. (*Trop. America.*[3])

106? **Eremopanax** H. Bn.[4]—Flowers nearly of *Schefflera* (of *Heptapleurum*); calyx short. Petals 5, valvate. Stamens 5, inserted under conical epigynous disk (at apex scarcely depressed stigmatose); filaments much incurved. Germen inferior, 1-celled, 1-ovulate. Fruit drupaceous; putamen 1, unsymmetrical, more or less gibbous on both sides to apex, sometimes produced to a thick woody earlike wing, 1-spermous. Seed descending; albumen uniform.—Climbing (?) shrubs; leaves digitate or partly simple; umbels compound; pedicels not articulate. (*N. Caledonia.*[5])

107. **Gastonia** Commers.[6]—Flowers[7] (nearly of *Schefflera*) hermaphrodite or polygamous; calyx short, undulate or crenate. Petals 8–15, thick, valvate. Stamens equal in number to petals or nearly so; filaments much inflexed, inserted under flat or depressed conical epigynous disk. Germen 8–15-celled; style very short thick; lobes small obtuse, in verticil, sometimes scarcely prominent (*Trevesia*[8]). Fruit drupaceous; pyrenes 8–15; seed uniform.—Trees or shrubs, glabrous, stellately pubescent or aculeate; leaves palmatifid or digitate (*Trevesia*), or pinnately compound[9] (*Reynoldsia*,[10] *Eugastonia*);

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[1] *Rev. Hort.* (1854) 109.—B. H. *Gen.* 939, n. 14.—Seem. *Journ. Bot.* vi. 131.

[2] "Qy. always?" (B. H.)

[3] Spec. about 10. Aubl. *Guian.* ii. 939, t. 360 (*Panax*).—Vahl, *Ecl.* i. 33 (*Panax*).—Sw. *Prodr.* 54 (*Panax*); *Fl. Ind. Occ.* ii. 562 (*Panax*).—H. B. K. *Nov. Gen. et Sp.* iv. 11 (*Panax*).—Seem. *Journ. Bot.* ii. 302, n. 14 (*Dendropanax*).

[4] *Adansonia*, xii. 158.

[5] Spec. about 3. H. Bn. *loc. cit.*

[6] Ex J. *Gen.* 217 (1789).—Lamk. *Dict.* ii. 610.—DC. *Prodr.* iv. 256.—Endl. *Gen.* n. 4555.—Seem. *Journ.* ii. 245.—B. H. *Gen.* 941, n. 19.—H. Bn. *Adansonia*, xii. 165.

[7] White or yellowish.

[8] Vis. *Mem. Accad. Tor.* ser. 2, iv. 262, ic.—Seem. *Journ. Bot.* iv. 352.—B. H. *Gen.* 942, n. 24.—Hook. *Fl. Ind.* ii. 731.—? *Parapanax* Miq. *Fl. Ind.-Bat.* Suppl. i. 338 (ex B. H.).

[9] Pinnæ sometimes (abnorm. ?) 3–5-foliolate. (See *Adansonia*, xii. 166.)

[10] A. Gray, *Unit. St. Expl. Exp. Bot.* i. 723, t. 92, 93.—Seem. *Journ. Bot.* ii. 244.

umbels simple or compound and in racemes. (*Trop. Asia and Oceania, Malacca, Mascarene isles.*[1])

108. **Gilibertia** R. et Pav.[2] — Flowers hermaphrodite; receptacle tubular. Calyx short, entire or denticulate. Petals 5–9, 3-angular, internally carinate at middle, valvate. Stamens same in number, inserted under conical disk passing into as many connivent styles as cells of germen; anthers cordate, shortly apiculate at apex. Germen inferior, 5–10-celled; cells sometimes irregularly verticillate, 1-ovulate. Fruit ovoid-oblong drupaceous; "pyrenes 5–7."—Glabrous trees or shrubs; leaves simple petiolate, entire or denticulate, "exstipulate"; flowers in simple or compound umbels (?); pedicels inarticulate. (*Trop. America.*[3])

109. **Panax** L.[4]—Flowers[5] hermaphrodite, or polygamous, 4-5-merous or more rarely 6–∞-merous (*Polyscias*[6]); calyx short or very short entire, crenate or denticulate. Petals 4–∞, valvate. Stamens same in number alternate and inserted under epigynous disk of various form, often confluent with base of styles. Germen inferior; cells 2–3 (*Eupanax, Nothopanax,*[7] *Raukaua,*[8] *Cephalopanax,*[9] *Sciadopanax,*[10] *Maralia*[11]), or equal in number to petals (*Polyscias, Eupteron,*[12] *Botryopanax,*[13] *Pseudopanax,*[14] *Cheirodendron*[15]), very rarely (*Cupocarpus*[16]) solitary by abortion, 1-ovulate. Styles distinct, elongately recurved or erect (*Nothopanax, Polyscias, Oligoscias*), more rarely highly or very highly connate (*Cephalopanax, Sciadopanax*), sometimes

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[1] Spec. about 10–12. Miq. *Fl. Ind.-Bat.* i. p. i. 747 (*Trevesia*).—DC. *Prodr.* iv. 256, n. 2 (*Gilibertia*).—Bak. et Balf. *Fl. Maurit.* 127, n. 5 (*Polyscias*).

[2] *Prodr.* 50, t. 8; *Fl. Per.* iii. 75, t. 312.—DC. *Prodr.* iv. 256, n. 1.—Seem. *Journ. Bot.* iii. 174.—B. H. *Gen.* 944, n. 27.—*Wangenheimia* Dietr.—*Ginannia* Dietr. (ex Steud.).

[3] Spec. 2. Seem. *loc. cit.*

[4] *Gen.* n. 1116 (part, not Seem.).—DC. *Prodr.* iv. 252 (part).—Endl. *Gen.* n. 4551 (part).—Dcne. et Pl. *Rev. Hort.* (1854) 105.—B. H. *Gen.* 938, n. 11.—H. Bn. *Adansonia*, xii. 148.—Hook. *Fl. Ind.* ii. 725.

[5] White, greenish or purplish.

[6] Forst. *Char. Gen.* 63, t. 32.—Endl. *Gen.* n. 4556.—Seem. *Journ. Bot.* iii. 179.—B. H. *Gen.* 941, n. 20.—Hook. *Fl. Ind.* ii. 727.

[7] Miq. *Bonplandia* (1859), 139; *Fl. Ind.-Bat.* i. p. i. 765.—Seem. *Journ. Bot.* iv. 293.

[8] Seem. *Journ. Bot.* iv. 352 (*Raukana*); vi. 142, 164.

[9] H. Bn. *Adansonia*, xii. 149.

[10] Seem. *Journ. Bot.* iii. 73, t. 27.

[11] Dup.-Th. *Gen. Nov. Madag.* 13.—DC. *Prodr.* iv. 255.—Endl. *Gen.* n. 4553.—*Oligoscias* Seem. *Journ. Bot.* iii. 179; vi. 141, 161, 164, t. 80.

[12] Miq. *Fl. Ind.-Bat.* i. p. i. 762; *Ann. Mus. Lugd.-Bat.* i. 3.

[13] Miq. *Ann. Mus. Lugd.-Bat.* i. 5.—*Grotefendia* Seem. *Journ. Bot.* ii. 247.—*Gastonia* Rœp. *Bot. Zeit.* (1848) t. 1 (not Commers.).—*Gilibertia* DC. *Prodr.* iv. 256, n. 3, 5 (not Commers. nor R. et Pav.).

[14] C. Koch, *Wochenschr.* (1859) 336 (part).—Seem. *Journ. Bot.* iii. 178.

[15] Nutt. ex Seem. *Journ. Bot.* v. 236.

[16] Dcne. et Pl. *Rev. Hort.* (1854) 109.—Seem. *Journ. Bot.* ii. 206.—B. H. *Gen.* 937, n. 10.

variously shaped in the same plant, either elongate, or very short (*Pseudopanax*, *Cheirodendron*). Fruit drupaceous; exocarp more or less fleshy; pyrenes 1–∞; vittæ 0 or rarely (*Sciadopanax*) conspicuous. Seed descending; albumen uniform or more rarely costate (*Sciadopanax*), rugose or subruminate (*Maralia*).—Glabrous or more rarely tomentose trees or shrubs; leaves alternate or the upper sometimes opposite (*Cheirodendron*), simple, 3-foliolate (*Cheirodendron*), digitately compound (*Pseudopanax*), or very often pinnate; inflorescence various; umbels or capitules (*Cephalopanax*) solitary or umbellate, corymbose, simple- or compound-racemose; pedicels articulate under flower; articulation very rarely (*Raukaua*) obscure. (*Trop. and temp. Asia and Oceania, east. ins. Africa, extra trop. S. America.*[1])

110? **Heteropanax** Seem.[2]—Flowers polygamous (*Panacis*); disk epigynous rather concave. Stamens 5. Disk depressed. Germen 2-celled; styles 2, erect, free, slender. Fruit much compressed contrary to septum, sub-2-dymous; albumen of compressed seed ruminate.—A tree; leaves pinnately decompound; stipules small; flowers in a full compound-ramose umbelluliferous raceme.[3] (*India, China.*[4])

111. **Cussonia** Thunb.[5]—Flowers hermaphrodite or polygamous (nearly of *Panax*); calyx short entire or dentate. Petals valvate. Stamens as many alternate; anthers subovate. Germen 2-celled ("sometimes 1-celled"); styles short or elongate, connivent or free; disk epigynous depressed or conical. Fruit subglobose or compressed contrary to septum; pyrenes 1–2; albumen of descending seed ruminate.—Glabrous trees or shrubs; leaves collected at top of twigs, digitate or palmatifid, sometimes twice digitate; leaflets entire, widely dentate or pinnatisect; flowers in dense simple or compound

[1] Spec. about 50. Wight, *Icon.* t. 573, 1062 (*Hedera*).—Hook. *Icon.* t. 583 (*Aralia*); *Lond. Journ. Bot.* ii. t. 11, 12.—Endl. *Ann. Wien. Mus.* i. t. 15.—C. Gay, *Fl. Chil.* iii. 151 (*Aralia*).—Hook. f. *Fl. Antarct.* t. 12; *Fl. Tasm.* t. 21; *Fl. N.-Zel.* t. 21; *Handb. N. Zeal. Fl.* 100.—A. Gray, *Unit. St. Expl. Exp. Bot.* i. 716; 718, t. 90, 91 (*Hedera*).—Benth. *Fl. Austral.* iii. 380.—Hiern, *Oliv. Fl. Trop. Afr.* iii. 27.—Bak. et Balf. *Fl. Maur.* 126.—H. Bn. *Adansonia*, xii. 450-452.

[2] *Fl. Vit.* 114 (note); *Journ. Bot.* iv. 297; v. 239.—B. H. *Gen.* 945. n. 31.—Hook. *Fl. Ind.* ii. 734.

[3] Gen. scarcely autonomous, sometimes allied to *Panax*, sometimes to *Aralia papyrifera*. Habit peculiar. Hairs mostly stellate. Fruit nearly of *Didymopanax* or *Mackinlaya*. Better perhaps a sect. of *Panax*, albumen not uniform (?).

[4] Spec. 1. *H. fragrans* Seem.—*Panax fragrans* Roxb. *Cat. Hort. Calc.* 21.—DC. *Prodr.* iv. 254.

[5] *Nov. Acta Upsal.* 210, t. 12, 13; *Nov. Gen.* i. 11.—L. f. *Suppl.* 182.—J. *Gen.* 217.—Lamk. *Dict.* ii. 230; *Ill.* t. 187.—DC. *Prodr.* iv. 255.—Endl. *Gen.* n. 4552 (part).—Seem. *Journ. Bot.* iv. 297.—B. H. *Gen.* 944, n. 30.—*Sphærodendron* Seem. *Journ. Bot.* iii. 33, t. 26.—B. H. *Gen.* 1009, n. 11 *a*.

spikes or racemes, 1-bracteate; pedicel not articulate. (*East. west. trop. and south. Africa, Malacca.*[1])

112. **Hedera** T.[2]—Flowers[3] dicœcious, polygamous or hermaphrodite; receptacle turbinate or obconical. Calyx very short, entire or 5-dentate. Petals 4–8, valvate. Stamens as many, inserted under depressed or more or less deeply conical disk. Germen 3–8-celled;[4] styles connate in cone or short column very shortly lobed at apex (*Euhedera*, *Kissodendron*[5]), or in great part or entirely free subulate, sometimes finally recurved (*Oreopanax*[6]). Fruit baccate or rarely subdrupaceous; putamen thin; albumen of descending seed uniform, rugose or very ruminate (*Euhedera*).—Trees or shrubs, glabrous or tomentose; leaves entire lobed, or digitately (*Oreopanax*), sometimes pinnately (*Kissodendron*) compound; stipules minute or 0; umbellules or capitules of flowers in compound racemes or umbels; bracts oftener few or 0. (*Temp. reg. of Old World, trop. and And. America, Australia.*[7])

113. **Curtisia** Ait.[8]—Flowers hermaphrodite, 4-merous; receptacle turbinate sub-4-gonal. Sepals 4, conspicuous, 3-angular. Petals 4, longer, valvate or slightly imbricate or contorted.[9] Stamens 4, alternipetalous; filaments erect subulate; anthers introrse, subcordate at base, 2-rimose.[10] Germen in great part inferior, crowned with thick glandular disk[11] interior to stamens produced upwards to short conical style stigmatose 3–4-lobed at apex. Ovules solitary in 3, or oftener 4 (oppositipetalous) cells, descending, incompletely

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[1] Spec. about 10. Jacq. f. *Ecl.* t. 61.—Colla, *Hort. Rip.* 43, t. 26.—Hochst. *Flora* (1834), 431.—Dietr. *Fl. Univ.* (1856) t. 90.—Harv. and Sond. *Fl. Cap.* ii. 568.—Hiern, *Oliv. Fl. Trop. Afr.* iii. 31.—Walp. *Rep.* ii. 430; v. 925; *Ann.* ii. 723.

[2] *Inst.* 612, t. 384.—L. *Gen.* n. 283 (part).—J. *Gen.* 214.—Gærtn. *Fruct.* i. 130, t. 26.—Lamk. *Dict.* iii. 511.—DC. *Prodr.* iv. 261 (part).—Spach, *Suit. à Buffon*, viii. 124.—Endl. *Gen.* n. 4560.—Seem. *Journ. Bot.* ii. 303; iii. 201, t. 32.—B. H. *Gen.* 946, n. 35.—H. Bn. *Adansonia*, xii. 164.

[3] White or greenish.

[4] Funicle of ovules oftener thickened to a small obturator over micropyle.

[5] Seem. *Journ. Bot.* iii. 201; v. 129; vi. 129.—*Irvingia* F. Muell. *Fragm.* v. 17 (not Hook. f.).

[6] Dcne. et Pl. *Rev. Hort.* (1854) 107, 108.—Seem. *Journ. Bot.* iii. 270.—B. H. *Gen.* 949, n. 34.

[7] Spec. about 60. Jacq. *St. Amer.* t. 61 (*Aralia*).—Sw. *Fl. Ind. Occ.* 518 (part).—Sm. *Ic. Pict.* t. 4.—Griseb. *Fl. Brit. W.-Ind.* 306 (*Sciadophyllum*).—H. B. K. *Nov. Gen. et Sp.* v. 1, t. 413–416 (*Aralia*).—G. Don, *Gen. Syst.* iii. 394.—Benth. *Fl. Austral.* iii. 384.—Miq. *Ann. Mus. Lugd.-Bat.* ii. 158.—Boiss. *Fl. Or.* ii. 1090.—Gren. et Godr. *Fl. de Fr.* ii. 1.—Walp. *Rep.* ii. 431 (part).

[8] *Hort. Kew.* ed. 1, 162; ed. 2, i. 270 (not Schreb.).—Endl. *Gen.* n. 4577.—B. H. *Gen.* 949, n. 3.—H. Bn. *Adansonia*, iii. 334; xii. 163.

[9] But always much less than in the theoretical fig. 214.

[10] After dehiscence flat rayed.

[11] Yellowish.

anatropous; micropyle extrorsely superior. Fruit drupaceous, at apex areolate or depressed-conical and girt with remains or scar of calyx; putamen hard 3–4-celled. Seed in cells solitary descending; albumen copious; radicle of more or less elongate embryo cylindrical superior.—Tomentose bushes; leaves (evergreen) opposite, petiolate, ovate-oblong acute, coarsely dentate, penninerved coriaceous; flowers[1] in terminal ramose and cymiferous racemes; pedicels articulate bracteate and 2–3-bracteolate. (*South. Africa.*[2])

114. **Meryta** Forst.[3]—Flowers[4] dicœcious, asepalous, 3–6-merous; receptacle of males small obconical; of females ovoid or subspherical, enclosing adnate germen. Petals thick, valvate; apical point incurved. Stamens equal in number to and alternating with petals; anthers ovate or ovate-oblong, introrsely 2-rimose (in female flower smaller, effete or 0). Germen (in male flower rudimentary) 3–6-celled; cells oppositipetalous; styles as many recurved or revolute, sulcate stigmatose within. Ovules in cells solitary descending; micropyle extrorsely superior. Fruit drupaceous; pyrenes 3–6, often costate, 1-spermous; albumen uniform.—Glabrous trees or shrubs; leaves alternate, simple or sinuate or widely dentate; flowers in subsimple or ramose capituliferous spikes or racemes; bracts and bracteoles squamiform small or shortly foliaceous and longer than the bud, entire or dentate. (*Subtrop. and temp. Oceania.*[5])

115. **Arthrophyllum** Bl.[6]—Flowers hermaphrodite or polygamous; calyx short, 5-dentate. Petals valvate; apex inflexed. Stamens inserted under conical disk passing into a short style above. Germen inferior, 1-celled; ovule 1, inserted under apex of cell; micropyle extrorsely superior, covered by thickened funicle. Fruit drupaceous; putamen crustaceous; albumen of subglobose pendulous seed deeply ruminate with transverse layers.—Glabrous trees or

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[1] Small, yellowish.

[2] Spec. 1. *C. faginea* Ait. *loc. cit.*—Lamk. *Ill.* t. 71.—DC. *Prodr.* ii. 12.—Harv. and Sond. *Fl. Cap.* ii. 570.—Harv. *Thes. Cap.* t. 124.

[3] *Char. Gen.* 119, t. 60.—J. *Gen.* 442.—Seem. *Bonplandia* (1862), 294.—B. H. *Gen.* 940, n. 16.—H. Bn. *Adansonia*, xii. 152.—*Botryodendrum* Endl. *Prodr. Fl. Norfolk.* 62; *Gen.* n. 4563.

[4] Yellowish or greenish.

[5] Spec. about 10. Guillem. *Ann. Sc. Nat.* ser. 2, viii. 349 (*Botryodendron*).—Dcne. *Voy. Vénus, Bot.* 25 (*Botryodendron*).—A. Gray, *Un. St. Expl. Exp. Bot.* i. 730, t. 96, 97 (*Botryodendron*).—Hook. f. *Handb. N. Zeal. Fl.* 104; *Bot. Mag.* t. 5932.—Walp. *Ann.* v. 85 (*Botryodendron*).

[6] *Bijdr.* 878.—DC. *Prodr.* iv. 266.—Endl. *Gen.* n. 4562.—Dcne. et Pl. *Rev. Hort.* (1854) 109.—Seem. *Journ. Bot.* ii. 206.—H. Bn. *Adansonia*, iii. 83; xii. 135, 158.—Hook. *Fl. Ind.* ii. 733.

shrubs ; leaves alternate imparipinnate, or the upper opposite simple ; stipules connate within base of petiole short or 0 ; flowers in solitary or umbellate umbellules ; bracts very small ; pedicels not articulate, or constricted under flower and sometimes obscurely articulate.[1] (*Malaya, Ind. Archip.*[2])

116. **Mastixia** Bl.[3]—Flowers (nearly of *Arthrophyllum*) 4–5-merous ; receptacle subcampanulate or turbinate. Calyx short, 4–5-dentate. Petals 4–5, and stamens of *Arthrophyllum*. Germen inferior, 1-celled, 1-ovulate ; style short thick, stigmatose at apex ; disk epigynous fleshy depressed or conical. Ovule descending ; micropyle extrorsely superior. Fruit drupaceous, subglobose or oblong, areolate at apex ; putamen hard, sometimes longitudinally sulcate and then having a vertically intruded process. Seed descending, sometimes deeply sulcate along process of putamen ; albumen fleshy uniform ; embryo small subapical.—Glabrous trees or bushes ; leaves [4] alternate and opposite, entire ; flowers in terminal compound-cymiferous (?) racemes ; pedicels articulate, 2-bracteolate.[5] (*East Ind. penins., Ceylon.*[6])

117. **Plerandra** A. Gray.[7]—Flowers [8] hermaphrodite (or polygamous ?) ; calyx short, entire, sinuate or dentate. Petals oftener 5, thick,[9] concave within, 2-locellate, valvate ; point induplicate. Stamens either 10, 5-adelphous ; filaments each 2-antheriferous alternipetalous (*Pentadiplandra* [10]) ; or 10–18, 1-seriate (*Triplasandra* [11]), sometimes to 15, " 1-seriate " (*Bakeria* [12]) or oftener ∞ , pluriseriate (*Tetraplas-*

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[1] Concerning the somewhat doubtful autonomy of the gen. *Mastixia* see next genus.

[2] Spec. 3, 4. Zoll. et Mor. *Verz.* 41.—Jungh. et de Vries, *Ned. Kruidk. Arch.* i. 19.—Miq. *Fl. Ind.-Bat.* i. p. i. 767, t. 14.—C. Koch, *Wochenschr.* (1859) 370.—Walp. *Ann.* i. 982.

[3] *Bijdr.* 654 ; *Mus. Lugd.-Bat.* i. 256, t. 58.—DC. *Prodr.* iv. 275.—Endl. *Gen.* n. 4578.—H. Bn. *Adansonia*, iii. 80.—B. H. *Gen.* 950, n. 6.—*Bursinopetalum* Wight, *Icon.* t. 956.—Thw. *Kew Gard. Misc.* vii. 242 ; *Enum. Pl. Zeyl.* 42.—Seem. *Journ. Bot.* ii. 205.

[4] Growing darker by desiccation.

[5] Gen. of *Nyssea* (Bl.), *Aquifoliaceæ* (Miers), *Cornaceæ* (B. H.), perhaps congeneric with *Arthrophyllum* from which it differs chiefly in the nature of its inflorescence and seed, nearly as *Eremopanax*, of which perhaps it would be better a section ; incorrectly considered by Decaisne (*Ann. Sc. Nat.* ser. 4, ix. 279) as *Olacinea-Opiliea*.

[6] Spec. 6, 7. Miq. *Pl. Jungh.* 426 ; *Fl. Ind.-Bat.* i. p. i. 771, 1095.—Walp. *Ann.* i. 124 (*Bursinopetalum*).

[7] *Un. St. Expl. Exp. Bot.* i. 729, t. 95 (1854).—Seem. *Journ. Bot.* ii. 241 ; *Fl. Vit.* t. 22.—B. H. *Gen.* 949, n. 36.—H. Bn. *Adansonia*, xii. 136–138.

[8] White or yellowish.

[9] Sometimes expanded near anthesis, sometimes more or less calyptrately coherent and circumscissus at base (which neither in the Order nor in the genus seems of moment varying much in the same plant).

[10] H. Bn. *Adansonia*, xii. 136.

[11] Seem. *Journ. Bot.* vi. 139, 165.

[12] Seem. *Journ. Bot.* ii. 248 ; *Fl. Vit.* t. 21.

andra,[1] *Tupidanthus*,[2] *Euplerandra*), rarely in 5 groups, alternipetalous; filaments simple or more rarely 2-furcate; anthers introrse, 2-celled, 2-rimose. Germen inferior; cells 1-ovulate 5, or 6–10 (*Tetraplasandra*, *Pentadiplandra*), 12–15 (*Euplerandra*) or ∞, sometimes "above 90" (*Tupidanthus*); styles small sometimes very small, either free, or connate in a more or less produced umbo. Fruit drupaceous; pyrenes 5-∞; seeds descending; albumen uniform, rugose or ruminate.—Trees or shrubs, sometimes high-climbing, unarmed, glabrous or more rarely tomentose; leaves alternate compound with connate intrapetiolate stipules, either pinnate (*Triplasandra*, *Tetraplasandra*), or oftener digitate (*Euplerandra*, *Bakeria*, *Nesopanax*, *Didiplandra*, *Tupidanthus*); umbellules sparsely bracteate or ebracteolate in compound racemes or in umbels; pedicels inarticulate. (*Warm Oceania, East. India.*[3])

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[1] A. Gray, *Unit. St. Expl. Exp. Bot.* i. 727, t. 94.—Seem. *Journ. Bot.* ii. 240.—B. H. *Gen.* 946, n. 37 (a name having priority but incorrect and applicable to no species of the genus).

[2] Hook. f. et Thoms. *Bot. Mag.* t. 4908 (1856). —Seem. *Journ. Bot.* ii. 239.—B. H. *Gen.* 947, n. 38.—Hook. *Fl. Ind.* ii. 740.

[3] Spec. about 9. Miq. *Ann. Mus. Lugd.-Bat.* i. 4 (*Tetraplasandra*). — Koch, *Wochenschr.* (1859) 348, ic. (*Tupidanthus*).—A. Gray, *Unit. St. Expl. Exped. Bot.* i. 726 (*Gastonia ?*). — H. Mann, *Enum. Haw. Pl.* 169 (*Gastonia ?*).— Walp. *Ann.* v. 81, 82 (*Tetraplasandra*), 83 (*Gastonia ?*).

LXIII. RUBIACEÆ.

I. MADDER SERIES.

The name of this family is derived from that of the Madder [1] (fig. 223-230) which has generally hermaphrodite, more rarely unisexual, pentamerous and monopetalous flowers. The receptacle, in such a species as *Rubia tinctorum*, is in the form of a deep pouch, nearly globular, slightly compressed laterally. This pouch encloses the ovary, and at its margin is inserted the corolla.[2] The latter is gamopetalous, regular, with a short wide tube, and limb deeply divided into five valvate lobes, one of which is anterior, two are lateral and two posterior. On the tube are inserted five alternipetalous stamens, formed each of a filament and a bilocular introrse anther dehiscing by two longitudinal clefts.[3] The ovary, inferior, is surmounted by an epigynous disk, encircling the base of a

Rubia tinctorum.

Fig. 223. Branch ($\frac{1}{2}$).

[1] *Rubia* T. *Inst.* 113, t. 37.—L. *Gen.* n. 127.—J. *Gen.* 197.—Lamk. *Dict.* ii. 604; Suppl. ii. 705; *Ill.* t. 60.—Gærtn. *Fruct.* iii. t. 195.—DC. *Prodr.* iv. 588 (part).—A. Rich. *Monogr. Rubiac.* 52, t. 1 (ex *Mém. Soc. d'Hist. Nat. Par.* v.).—Spach, *Suit. à Buffon*, viii. 470.—Endl. *Gen.* n. 3101.—Payer, *Organog.* 633, t. 129.—B. H. *Gen.* ii. 149, n. 329.—Hook. *Fl. Ind.* iii. 202.—*Aparine* Adans. *Fam. des Pl.* ii. 144 (incl.: *Callipeltis* Stev. *Didymæa* Hook. f. *Galium* T. *Mericarpæa* Boiss. *Relbunium* Endl. *Valantia* L.).

[2] Around the base is a small border usually described as a limb of the calyx, entire or "*obsolete.*" It is then supposed that the greater part of the calyx envelopes the ovary to which it is "adherent," and it is called the "calycinal tube;" expressions which indicate hypotheses not justified by facts. The border referred to is that of the receptacular orifice.

[3] In *Rubia* the pollen has more than three folds. In *R. tinctorum*, there are six or seven, according to H. Mohl (*Ann. Sc. Nat.* ser. 2, iii.

short style with two branches, the stigmatiferous extremities of which expand to a small head, and the two ovarian cells, one anterior, the other posterior, contain each, inserted near the base of the internal angle, an ascending, nearly erect, anatropous ovule, with micropyle

Rubia tinctorum.

Fig. 224. Flower (4).

Fig. 225. Diagram.[1]

Fig. 226. Long. sect. of flower.

directed downwards and outwards.[2] The fruit, didymous or more generally reduced to a single carpel (fig. 227-229), is fleshy, with pericarp of little thickness, and encloses one or two seeds, convex

Rubia tinctorum.

Fig. 227. Long. sect. of dicoccous fruit (3).

Fig. 230. Seed (3).

Fig. 228. Monospermous fruit.

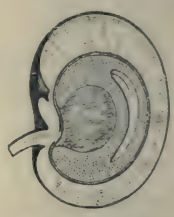

Fig. 229. Long. sect. of monospermous fruit.

externally, concave internally, where the wide hilum is united to the pericarp by a short thick funicle occupying the cavity. The seeds have a thick horny[3] albumen, surrounding a curved embryo with inferior conical radicle and foliaceous cotyledons directed upwards. *Rubia tinctorum* is a perennial herb, with a thick stem, sending out

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323). According to the same author there are 8 to 12 in different species of *Galium*, *Asperula* and *Crucianella*.

[1] The petals should be connected by a line in this diagram of a flower exceptionally tetramerous, like that of *Galium*.

[2] This micropyle is most frequently indicated, in this and many other genera, only by a slight indentation; so that in this case the ovules have not a true coat; at least in comparison with other types where it is somewhat more developed, it is admitted to exist but reduced to an extremely short cushion.

[3] Without affirming that the cushion called tegument of the seed is produced by a change in superficial tissues, but that it cannot result from the transformation of an ovular envelope which never existed at this point.

adventitious roots[1] and rough herbaceous aerial branches, opposite leaves and leaflike stipules. The flowers[2] are collected in axillary and terminal compound cymes, and the pedicel is articulate under the ovary.

The flowers are sometimes tetramerous in *Rubia* (fig. 225). It is the rule in *Galium*,[3] the pericarp of which is dry, or coriaceous,[4] or less fleshy than that of *Rubia* proper, though this difference, presenting every possible gradation, can justify only its forming a section of the genus *Rubia* (from which *Galium* is ordinarily distinguished as a genus). In some American species of *Galium* the inflorescences are surrounded by an involucre of four bracts; of these a genus, *Relbunium*,[5] has been made.

In Mexico there is a *Rubia* with fleshy fruit, whose opposite leaves are accompanied with four interfoliar stipules little developed instead of presenting the form and appearance of leaves proper; the generic name of *Didymœa*[6] has been conferred upon it.

In the *Rubias* of the section *Galium*, the surface of the fruit is sometimes smooth and sometimes charged with asperities, points or tubercles. In one, *G. cristatum*,[7] native of Assyria, each of the cocci has three more distinct prominences in the form of sinuous or dentate crests, the upper teeth of which may also be hooked; this has constituted a genus *Mericarpœa*.[8]

In some species of *Galium*, such as *G. Cruciata*, &c., there are in the axil of the leaves, not one, but two collateral cymes, or three, one medial and two lateral. The number of flowers in each cyme may be much reduced.[9] In some species, of which the genus *Vaillantia*[10] has been made, there are only three flowers in the axil. The medial is hermaphrodite and tetramerous, and the lateral are

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[1] The number of which, we know, is augmented in cultivation by earthing up.

[2] Small, yellowish or pale green.

[3] T. *Inst.* 114, t. 39 (*Gallium*).—L. *Gen.* n. 125.—Scop. *Fl. Carniol.* (ed. 2) i. 94.—DC. *Prodr.* iv. 593.—Rich. *Rub.* 53.—Spach, *Suit. à Buffon*, viii. 469.—Endl. *Gen.* n. 3100.—B. H. *Gen.* ii. 149, n. 331.—Hook. *Fl. Ind.* iii. 204.—*Aparine* T. *Inst.* 114, t. 39.—*Cruciata* T. *loc. cit.* 115, t. 39.—*Eyselia* Neck. *Elem.* n. 333.—*Aspera* Mœnch, *Meth.* 640.

[4] It may be inflated, more or less vesicular, as in *G. glaucum* L. On this character is founded the genus *Microphysa* (Schrenk, *Bull. Acad. Pétersb.* ii. 115.—Walp. *Rep.* vi. 18).

[5] Endl. *Gen.* 523 (sect. *Galii*).—B. H. *Gen.* ii. 149, n. 330.

[6] Hook. f. *Gen.* ii. 150, n. 333; *Icon. Plant.* t. 1271.

[7] Jaub. et Spach, *Ill. Pl. Or.* ii. t. 194.

[8] Boiss. *Diagn. Or.* iii. 51; *Fl. Or.* iii. 83.—B. H. *Gen.* ii. 149, n. 332.

[9] And often, in a few-flowered cyme, the lateral flowers are male, sometimes trimerous, the central alone being hermaphrodite.

[10] T. *Act. Acad. Par.* (1705) 234.—L. *Gen.* n. 1151 (*Valantia*).—Poir. *Dict.* viii. 285 (part).—DC. *Fl. Fr.* iv. 266; *Prodr.* iv. 613.—Rich. *Rub.* 54, t. 1, fig. 2.—Endl. *Gen.* n. 3098.—B. H. *Gen.* 148, n. 328.—H. Bn. *Payer Fam. Nat.* 232.

male and ordinarily trimerous. The ovary of the medial becomes a fruit, one of the mericarps of which is frequently aborted; its pedicel is recurved so as to bear the fruit below, and is accompanied with the pedicels of the two male flowers, more or less transformed to crests.[1] There is also in the Levant and Mediterranean region, an exceptional *Galium*, type of a genus *Callipeltis*,[2] the hermaphrodite flowers of which are axillary and ternate, pendent, enclosed each in a cymbiform, membranous bract, which grows and folds itself longitudinally round the fruit, ordinarily reduced to a single fertile carpel, more elongate than that of other species of *Galium* and incurved at maturity like the seed it encloses. We consider all these types as so many sections[3] of one and the same genus *Rubia*, thus comprising some two hundred[4] species, belonging to all regions of both worlds, chiefly to the temperate portions.

Asperula odorata.

Fig. 231. Floriferous branch.

Asperula (fig. 231–234) has been distinguished from *Rubia* and *Galium* chiefly by the form of the corolla, which is tubular or funnel-shaped instead of rotate or bell-shaped. This distinction is somewhat artificial.[5] The flowers have no true calyx. What has

[1] There may be a fourth and a fifth male flower continuing the cyme, but more or less completely aborted.

[2] Stev. *Obs. Pl. Ross.* 69 (ex *Mém. Mosc.* vii. 275).—DC. *Prodr.* iv. 613.—Endl. *Gen.* n. 3099.—B. H. *Gen.* ii. 148, n. 327.—*Cucullaria* Buxb. *Cent.* i. 13.

[3] Rubia. Sect. 8.
1. *Eurubia.*
2. *Didymæa* (H. f.).
3. *Galium* (T.).
4. *Relbunium* (Endl.).
5. *Mericarpæa* (Boiss.).
6. *Cruciata* (T.).
7. *Vaillantia* (T.).
8. *Callipeltis* (Stev.).

[4] Lamk. *Ill.* t. 842, fig. 2 (*Vaillantia*).—Sibth. *Fl. Græc.* t. 115, 116 (*Sherardia*), 137, 138 (*Vaillantia*), 141, 142.—H. B. K. *Nov. Gen. et Sp.* t. 277 (*Galium*), 280.—Reichb. *c. Fl. Germ.* t. 1184; 1185–1198, 1201 (*Galium*).—Wight, *Ill.* t. 128 bis; *Ic.* t. 187.—Harv. et Sond. *Fl. Cap.* iii. 34, 35 (*Galium*).—Thw. *Enum. Pl. Zeyl.* 151.—Benth. *Fl. Hongkong.* 164 (*Galium*).—Miq. *Fl. Ind.-Bat.* ii. 337, 338 (*Galium*); Suppl. 225.—Benth. *Fl. Austral.* iii. 445 (*Galium*).—F. Muell. *Fragm.* ix. 188 (*Galium*).—Griseb. *Fl. Brit. W.-Ind.* 351 (*Galium*).—A. Gray, *Man.* (ed. 2) 169 (*Galium*).—Clos, *C. Gay Fl. Chil.* iii. 177 (*Galium*).—Boiss. *Fl. Or.* iii. 46–83.—Gren. et Godr. *Fl. de Fr.* ii. 13, 14 (*Galium*), 46 (*Vaillantia*).—Walp. *Rep.* ii. 454 (*Galium*), 460; vi. 8 (*Mericarpæa*), 9, 81 (*Microphysa*); *Ann.* i. 366, 983 (*Galium*); ii. 734 (*Galium*), 738; iii. 901 (*Galium*); v. 97 (*Galium*).

[5] We may also say that it is not absolutely constant. "The generic distinction between *Asperula* and *Galium* is not absolute because the female flowers of the former are sometimes like those of *Galium*." (F. Muell. *Fragm.* ix. 188.)

been regarded as such in *Sherardia arvensis*, which is only an *Asperula* of a particular section, are two bracts and their stipules, ordinarily described as six sepals and borne by the floral receptacle. *Crucianella* is also *Asperula* with ovules nearly basilar and erect, and whose style has two unequal branches. The flowers, sessile and accompanied

Asperula (Phuopsis) stylosa.

Fig. 232. Bud (4).

Fig. 234. Long. sect. of base of flower.

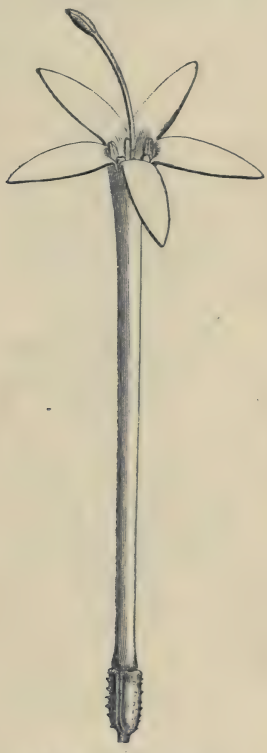

Fig. 233. Flower (4).

with two bracts, are often disposed in elongate spikes of cymes. In *C. stylosa*, of which a genus *Phuopsis* has been made, the whole inflorescence resembles a capitule; it is also, as in many species of *Asperula* proper, formed of contracted cymes, arranged on a shortened principal axis. The style is here divided into two branches, but free only at the extreme summit. Thus constituted, the genus *Asperula* is formed of herbs from the temperate regions of Europe, Asia,

Australia and Africa. Their organs of vegetation are generally much like those of *Rubia*.

II. SPERMACOCE SERIES.

In *Spermacoce*[1] (fig. 235, 236), the flowers, hermaphrodite or more rarely polygamous, have a receptacle in the form of an ovoid or obconical sac, lodging in its cavity the ovary surmounted by a disk

Spermacoce (*Borreria*) *Poaya*.

Fig. 235. Inflorescence.

Fig. 236. Long. sect. of flower ($\frac{3}{1}$).

more or less thick, sometimes nil or nearly so. The margin of the sac supports a calyx of 2–6 divisions, very variable in form and appearance, with a variable number of small tongues interposed,[2] and a regular gamopetalous corolla,[3] funnel-shaped or hypocrateriform,

[1] L. *Gen.* n. 110.—J. *Gen.* 197.—Gærtn. *Fruct.* i. t. 25.—Lamk. *Ill.* t. 62.—DC. *Prodr.* iv. 552.—Rich. *Rub.* 70, t. 4, fig. 2, 3.—Endl. *Gen.* n. 3121.—B. H. *Gen.* ii. 145, n. 319.—Baker, *Fl. Maurit.* 158.—Hook. *Fl. Ind.* iii. 199.—? *Tardavel* Adans. *Fam. des Pl.* ii. 145 (ex Endl.).—*Covelia* Neck. *Elem.* n. 339.—*Chenocarpus* Neck. *Elem.* n. 339.—*Bigelovia* Spreng. *Syst.* i. 366.—*Borreria* G. F. Mey. *Prim. Fl. Essequeb.* 79, t. 1.—Endl. *Gen.* n. 3120.—*Chlorophytum* Pohl (ex Endl.).—? *Gruhlmannia* Neck. *Elem.* n. 338 (ex Endl.).—*Tessiera* DC. *Prodr.* iv. 574.—*Diphragmus* Presl, *Bot. Bem.* 80.

[2] Several of which are probably of stipular nature.

[3] White, pink, yellow or bluish, violet.

the divisions of which, four or five, more rarely six in number, are valvate in the bud. The stamens, inserted lower or higher on the tube of the corolla, often even at its throat, which is bare or hairy, are formed of a filament variable in length, and of a dorsifixed, enclosed or exserted, bilocular, introrse anther dehiscing by two longitudinal clefts. The ovary is surmounted by a style of simple capitate stigmatiferous extremity, entire or divided into two short obtuse branches; and each of its two [1] cells, one anterior the other posterior, contains a single ascending ovule, more or less completely anatropous, with micropyle exterior and inferior.[2] It is inserted at greater or less height on the partition separating the cells, and the base of its raphe sometimes adheres to the partition to a variable extent. The fruit of the true *Spermacoce* is dicoccous, crustaceous or coriaceous, little fleshy, and the two cocci separate from each other at maturity; after which they open at the internal angle either in their entire length or only at the top; or one only opens, the other remaining indehiscent. Each encloses a seed whose exterior coat, furrowed, often granular externally, covers an albumen more or less hard. In the centre of the latter is lodged an axile embryo with foliaceous cotyledons and inferior cylindrical radicle. They are herbs annual, perennial or woody at the base; leaves opposite with penniform or parallel nerves, those of the same pair united by interpetiolate connate stipules, often divided into hairs at the upper margin. The flowers are in glomerules or cymes with short pedicels, forming false verticils in the axil of the leaves, or false capitules at the ends of the branches. There the leaves may be reduced to the form of bracts. The number of species is estimated at 150 inhabiting all the tropical regions of both worlds and especially common in the new.

S. ampliata, from eastern tropical Africa, of which a genus *Hypodematium* [3] has been made, is distinguished as a section because its fruit divides circularly near the base, nearly like a pyxis, before the separation of the cocci. A similar fact occurs in the American

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[1] Sometimes three or four.

[2] The envelope, very short, is however more distinct in some species of this genus (*S. tenuior*, for example) than in most of the *Rubiece*. The micropylar orifice also often deviates laterally.

[3] A. Rich. *Fl. Abyss. Tent.* i. 348.—Hiern, *Fl. Trop. Afr.* iii. 241.

species, with unequal sepals,[1] of which the genus *Mitracarpum* has been made.[2] But the transverse scission takes place at variable heights according to the species, and in some near the middle; the upper portion of the membranous pericarp rises as a lid, bearing the calyx on the top. In other American species, generically distinguished under the name of *Staelia*,[3] the line along which the carpels open at maturity is not transverse but more or less oblique from within outwards and from above downwards; these plants are thus intermediate between *Mitracarpum* and *Spermacoce* proper. In other American and African species of *Spermacoce*, the cocci once separated remain indehiscent like achenes; of these have been made the genera *Diodia*[4] and *Dasycephala*.[5] The former has as many as ten divisions in the calyx and little prominent obtuse lobes at the stigmatiferous portion of the style; the axillary flowers are generally few. The latter has four calycinal divisions, the two style branches bristling with papillæ, and the floral glomerules not unfrequently disposed in spikes. *S. filifolia*, from western tropical Africa, and a neighbouring species have been raised to the rank of a genus (*Octodon*[6]), because the flowers united in false capitules of glomerules, most frequently at the ends of the branches, are surrounded by a pair of leaves forming an involucre to the inflorescence, with connate stipules constituting a sort of dilated sheath; whence these annuals present a peculiar habit.

Thus defined,[7] this genus comprises about two hundred species.[8]

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[1] The largest are the lateral, described, in certain species, as lateral bracteoles of the flower borne on its receptacle.

[2] Zucc. *Schult. Mant.* iii. 210.—DC. *Prodr.* iv. 571.—Endl. *Gen.* n. 3127.—B. H. *Gen.* ii. 146, n. 323. — *Staurospermum* Thönn. et Schum. *Beskr. Guin.* 73.

[3] Cham. et Schlchtl, *Linnæa*, iii. 364, t. 3, fig. 3.—Rich. *Rub.* 71.—Endl. *Gen.* n. 3129. — B. H. *Gen.* ii. 148, n. 326.

[4] L. *Gen.* n. 122.—J. *Gen.* 197.—Gærtn. *Fr.* i. t. 121.—DC. *Prodr.* iv. 561.—Endl. *Gen.* n. 3123.—B. H. *Gen.* ii. 143, n. 314. We refer, with doubt, to *Diodia, Hexasepalum* (Bartl. ex DC. *Prodr.* iv. 561;—Endl. *Gen.* n. 3122;—B. H. *Gen.* ii. 145, n. 318), which has the narrow (and still more elongate) leaves of *Diodia*, with wide ciliate sheathlike stipules, and "solitary, axilate" flowers which we have not seen.

[5] DC. *Prodr.* iv. 565 (*Diodiæ* sect. 2).—B. H. *Gen.* ii. 143, n. 315.

[6] Thönn. et Schum. *Beskr.* 74.— DC. *Prodr.* iv. 540.—Endl. *Gen.* n. 3119.—B. H. *Gen.* ii. 145, n. 320.

[7] Sect. 7: 1. *Euspermacoce* (incl. *Borreria*); 2. *Staelia*; 3. *Mitracarpum*; 4. *Diodia*; 5. *Dasycephala*; 6. *Octodon*; 7. *Hypodematium*.

[8] R. et Pav. *Fl. Per.* t. 91, 92.—H.B.K. *Nov. Gen. et Sp.* t. 278.—Miq. *St. Surin.* t. 51 (*Borreria*); *Fl. Ind.-Bat.* ii. 330, 333 (*Bigelovia*); Suppl. 550.—Benth. *Fl. Hongk.* 162; *Fl. Austral.* iii. 438.—Harv. and Sond. *Fl. Cap.* iii. 25 (*Mitracarpum*).—Bak. *Fl. Maur.* 158.—Thw. *Enum. Pl. Zeyl.* 151.—Griseb. *Fl. Brit. W.-Ind.*

Richardia is very near *Spermacoce;* it has an ovary of three or four cells, a well-developed calyx of 3–8 divisions, and a style divided above into three or four recurved branches, pointed or terminated by a stigmatiferous enlargement of variable form. The fruit separates into three or four cocci, indehiscent or dehiscent near the top, united or not by a small central column. They are herbs of tropical or subtropical America, covered with hairs, with opposite leaves and flowers in glomerulous capitules. *Perama*, also of tropical America, has a fruit very analogous to that of *Richardia*, dehiscing by a transverse cleft above the middle, with or without a thin persisting partition. They are herbaceous plants, often very small, from tropical America, whose calyx (?) has only two folioles and the 2–4-celled ovary is surmounted by a slender exserted style with 2–4 stigmatiferous divisions. The flowers, small and numerous, are in false spikes or capitules, on long and slender peduncles, and plunged, as it were, in tufts of numerous setaceous bracts.

In *Triodon*, very different in habit, being much-branched American shrubs with small leaves and flowers in glomerulous spikes, the fruit separates into two indehiscing cocci, and the calycinal divisions are 2–4, with interposed stipular teeth; the ovary, bilocular, is surmounted by a style with two branches bristling with papillæ. *Psyllocarpus*, not unlike in habit and with inflorescence also spike-like, has two large lateral divisions in the calyx, with others smaller interposed. The ovary is bilocular and surmounted by a style, the two stigmatiferous branches of which are short and generally obtuse; the fruit is dicoccous, much compressed from back to front, and each of the cocci finally opens internally by a longitudinal cleft. They are low Brazilian shrubs. *Gaillonia* has also the flowers of *Spermacoce* or nearly so; the calyx is 2–6-dentate, or dilated to a horn, or covered with feathery hairs. The ovary has two uniovulate cells, and the style is slender, elongate, divided above into two short papillose branches. The two cocci of the fruit are indehiscent and finally separate. They are Asiatic and African shrubs, often rigid, with leaves little developed, flowers solitary or united in spikes of

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349, 350 (*Mitracarpum*).—A. Gray, *Man.* (ed. 2) 171.—Walp. *Rep.* ii. 464 (*Borreria*), 465, 466 (*Diodia*), 467 (*Mitracarpum*); vi. 27 (*Borreria*), 29, 30 (*Diodia*), 31 (*Mitracarpum*); *Ann.* i. 37 (*Borreria*); ii. 741 (*Borreria*), 742, 743 (*Hypodematium*); v. 105 (*Borreria*), 106 (*Mitracarpum*).

cymes. Their habit is often quite peculiar. *Crusea*, American, has narrow and elongate calycinal divisions; a corolla of *Spermacoce* generally tetramerous and rather large; a bilocular ovary with short divisions or scarcely distinct. The fruit divides into two indehiscent cocci. They are herbaceous plants, the compound terminal cymes of which resemble capitules and are surrounded by two pairs of large bracts forming an involucre. In *Emmeorhiza*, subshrubby and volubile plants of tropical America, the cymes, much branched, resemble the inflorescences of *Rubia* proper; and the tetramerous flowers are nearly those of *Spermacoce*, with a style of two shallow terminal divisions, and a fruit whose two monospermous cocci open inwards, like those of *Psyllocarpus*.

Hydrophylax and *Ernodea*, the flower of which is nearly that of a *Crusea* or a *Diodia*, axillary, solitary or nearly so, and rather large for this group, differs also from all the preceding types in its fruit being indehiscent; the two cocci, much compressed and with flat face, can only be separated artificially. The deep divisions of the calyx are ordinarily four in number, two of which are lateral (more rarely five or six). The corolla has a long narrow tube and valvate limb. The true *Hydrophylax* grows in the maritime sands of tropical Asia, Madagascar, and southern Africa. The summit of the style is a little enlarged and obscurely bilobed, and the exocarp is suberose. *Ernodea*, with us only a second section of the same genus, has the summit of the style somewhat enlarged and a less consistent exocarp, more distinct from the cocci; it inhabits the coasts of the Antilles and Florida.

III. ANTHOSPERM SERIES.

The Anthosperms[1] (fig. 237, 238), which have given name to this series, are not always its most perfect representatives, because the flowers are not ordinarily hermaphrodite, but unisexual. In those in

[1] *Anthospermum* L. *Hort. Cliff.* t. 27; *Gen.* n. 1164.—J. *Gen.* 197.—Gærtn. f. *Fruct.* iii. 87, t. 195.—A. Rich. *Rub.* 58, t. 2, fig. 1.—DC. *Prodr.* iv. 579.—Endl. *Gen.* n. 3105.—B. H. *Gen.* ii. 140, n. 304.—*Tournefortia* Ponted. *Epist.* 11 (ex Endl.).

which the gynæcium is well developed, the receptacle is sacciform, most frequently obovoid, the cavity lodging the bilocular ovary, surmounted by an epigynous disk of little thickness with two very long slender branches, and a style everywhere bristling with papillæ. In the male flower the receptacle becomes very small; the ovary disappears, and the stylary branches alone, sometimes much reduced in size, may represent the gynæcium. The calyx inserted at the mouth of the receptacle is often very short, nearly entire or with persistent teeth of variable size. One or two of them may even become foliaceous. The corolla varies in form in the flowers of the two sexes. In the males it is well developed, bell- or funnel-shaped, glabrous or hairy at the throat, with 3–5 valvate lobes. In the females it generally becomes small, narrow, tubular with 2–5 erect teeth or lobes, often applied to the styles. The stamens, wanting or remaining rudimentary in the female flowers, number 3–5 in the males, inserted on the tube of the corolla, formed of a very slender and mobile filament, often incurved by the weight of the elongate, exserted, introrse, bilocular, dorsifixed anther dehiscing by two longitudinal clefts. In each ovarian cell, quite at the base of the internal angle, is inserted an ascending, anatropous ovule, with micropyle exterior and inferior. The fruit, didymous, compressed perpendicular to the partition, separates into two cocci, indehiscent or dehiscing along the face, and enclosing each a seed with thin coat, covering a fleshy or hard albumen, the axis of which is occupied by an elongate embryo, with foliaceous cotyledons and inferior cylindrical radicle. The *Anthosperms*, of which more than a score of species[1] have been described, natives of southern, eastern and western tropical Africa and Madagascar, are shrubs of small figure, erect or drooping, glabrous or hairy, with opposite or verticillate, ordinarily ericoid leaves, united by a membranous interpetiolar sheath, more or less mingled with stipules the summit of which is often cut to one or more points.

Anthospermum æthiopicum.

Fig. 237. Male flower (♂).

[1] Cruse, *Rub. Cap.* 7, t. 1, fig. 1, 2.—Spreng. *Syst. Veg.* i. 399.—Harv. and Sond. *Fl. Cap.* iii. 26.—Hiern, *Fl. Trop. Afr.* iii. 229.—Walp. *Ann.* ii. 741.

The flowers[1] are axillary, solitary or in cymes, often sessile, accompanied with bracteoles. There are species in which they are borne on the elongate axes of the cyme. In *A. Crocyllis*,[2] of which a separate genus has been made,[3] the flowers, pentamerous or unisexual, have thicker staminal filaments inserted higher up on the corolla than in other species. The style is also thicker and divided only in its upper portion. In *Anthospermum*, to which the name *Nenax*[4] has been given, the partition separating the cells presents a sort of reduplication which, as in some *Umbelliferæ* (pp. 96, 98), produces two false cells without ovules between the fertile cells.

Anthospermum æthiopicum.

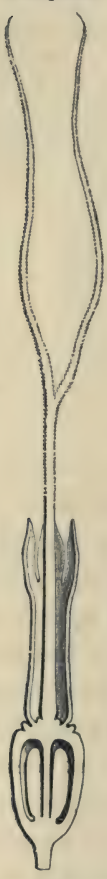

Fig. 238. Long. sect. of female flower (♀).

Coprosma is extremely near *Anthospermum*; it has the same polygamo-dicœcious flowers of 4–6 parts. They are solitary or grouped in axillary or terminal cymes; sometimes subsessile. The fruit is a drupe with two plano-convex putamens, sometimes four, the number of ovarian cells being also four, as in *Nenax* among the *Anthosperms*. They are Oceanic shrubs ranging from the tropics to New Zealand; there is said to be one in Juan Fernandez. The leaves, opposite and accompanied with connate interpetiolar stipules, are ordinarily large and penninerved. *Normandia*, notwithstanding a peculiar habit, differs little from *Coprosma* with flowers in terminal cymes. Its valvate corolla has five short lobes, and the staminal filaments, inserted at the base of the corolla, are longer in proportion as the gynæcium of the polygamous flowers is less developed. The anther cells are prolonged downwards each in a long point, and the fruit at maturity separates into two cocci which open

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[1] Small, not showy, whitish, yellowish or greenish, inodorous or with variable odour.

[2] Sond. *loc. cit.* 32, n. 18.

[3] *Crocyllis* E. Mey. exs. *Drég.*—B. H. *Gen.* ii. 136, n. 294.

[4] Gærtn. *Fruct.* i. 165, t. 32, fig. 7.—B. H. *Gen.* ii. 140, n. 306.—*Ambraria* Cruse, *Rub. Cap.* 16, t. 1, fig. 3, 4.—Rich. *Rub.* 59, t. 2, fig. 2.—Endl. *Gen.* n. 3106.—Harv. and Sond. *Fl. Cap.* iii. 33.

longitudinally at the middle of the face. *Nertera* has also nearly the flowers of *Coprosma*, axillary or terminal, solitary. They are slender creeping plants, glabrous or slightly hairy. The flower has a short annular calyx, entire or with five divisions in the true *Nertera*, the fruit of which is also more fleshy, with two compressed putamens. In one American species, of which the genus *Corynula* has been made, the exocarp is less fleshy, coriaceous, and the five calycinal divisions are less deep. This genus is found in both South America and Oceania from the tropics to the Antarctic regions. *Serissa* has nearly the flower of the preceding genera, ordinarily hermaphrodite, with funnel-shaped, valvate-induplicate corolla, furnished internally with papillose hairs. The bilocular ovary is surmounted by a tolerably developed disk, and a style divided above into two stigmatiferous branches. It comprises two shrubs of eastern Asia with opposite leaves, setose stipules, axillar or terminal flowers, solitary or in few-flowered cymes. *Galopina* has nearly the same flowers as *Serissa*, but the corolla is glabrous within; they are polygamo-dicœcious and in terminal cymes at the top of the branches of erect herbs with oval or lanceolate leaves. The receptacle, lodging the ovary, is obcordate, punctuate, papillose or muricate; the calyx is little developed or nil and the fruit dicoccous. The flowers, small and 4, 5-merous, are in much divided compound terminal cymes with slender pedicels. It consists of Cape herbs. *Kelloggia*, a Californian herb, very near *Galopina*, has tetramerous flowers of nearly the same organization. The style is divided above into two branches, and the ovary, crowned by a calyx of four pointed lobes, is quite covered with hooked points like that of the *Circeæ*. The fruit is dicoccous. The leaves are opposite with pointed interpetiolar stipules, and the inflorescence is in terminal few-flowered cymes. *Cremocarpon*, of Comoro, is a woody plant whose characters ally it both to *Kelloggia* and *Galopina*. Its axillary inflorescences are dichotomous cymes whose flowers have a glabrous ovary crowned by four sepals and a corolla, the four valvate lobes of which are surmounted, above and without, with a small conical horn. The style is divided above only into two stigmatiferous branches, and accompanied at the base by two reniform glands, superposed to the cells and representing the epigynous disk. The fruit is formed of two cocci with five salient ridges, united by a sort of columella with two branches themselves bifurcate and corre-

sponding to the margins of the carpels. The cocci, separated from each other, remain long suspended from these bifurcate branches. *Carpococe* is distinguished from all the preceding types by the unsymmetrical character of its fruit which, by abortion, has only one fertile cell containing one erect seed, and by the unequal divisions of the calyx which persist above the fruit. The corolla, with a slender tube, has five valvate divisions and varies as to form in the male flowers and in those in which the gynæcium is well developed; the divisions also bear a superior dorsal horn. The stamens are inserted at the base of the corolla; the style is simple and the other characters of these herbs or undershrubs of the Cape are nearly those of *Anthospermum*. *Otiophora*, herbs and undershrubs of Madagascar, also often has one cell aborted in the fruit with thin and dry pericarp, and is also crowned with unequal sepals one or two of which develope into a foliaceous layer. The hermaphrodite flowers are solitary or geminate at the level of each leaf or of the bracts which replace them at the top of the branches, in this case resembling spikes. The style is long, slender and bifid, and the stamens are inserted in the throat of the corolla. *Plocama*, branched shrubs of the Canaries, has elongate, opposite or verticillate leaves, polygamous flowers, axillary or terminal, solitary or in cymes, and the corolla of *Anthospermum* with 4–7 valvate lobes; the same number of stamens, inserted in the throat, and a 2–4 celled ovary, surmounted by a tolerably thick style, the summit of which is divided into as many very small obtuse teeth. The fleshy fruit encloses 2–4 erect seeds immersed, like the ovules, in a glutinous

Phyllis Nobla.

Fig. 239. Floriferous branch ($\frac{1}{3}$).

matter. *Putoria*, very small shrubs of the Mediterranean region, with flowers in terminal umbelliform cymes, has a tetramerous corolla, with an elongate, sometimes slightly curved, tube, four stamens inserted in the throat of the corolla, and a bilocular ovary, surmounted by a long style attenuate at the summit and there only divided into two unenlarged stigmatiferous teeth. The fruit is a drupe with two putamens. In *Phyllis* (fig. 239), the only known species of which inhabits the isles off the north-west coast of Africa, the flowers are polygamous and in cymes ordinarily compound, terminal and axillary. In the hermaphrodite flowers, the ovary is surmounted by a corolla with four or five valvate divisions, four or five alternate epigynous stamens, with slender filaments and introrse anthers, and encloses two cells; the sepals are very small or rudimentary, or even totally wanting. The two stylary branches are divergent and bristle with papillæ. The fruit is dry and separates into two monospermous and indehiscent cocci. The androecium or gynæcium is more or less aborted in the other flowers according as they are female or male. It is a small undershrub with opposite or verticillate leaves, the stipules of which very generally bear small dark glands.

The *Opercularias* (fig. 240–245), with many authors, have formed a separate tribe (*Opercularieæ*), because their inflorescence resembles a capitule and the uniovulate ovarian cells are solitary in each flower. The inflorescences are in reality contracted cymes united in heads, in which the receptacles of the different flowers are connate. In *O. umbellata* (fig. 240, 241), in each inflorescence of which the flowers are less numerous, generally only three, belonging to two different generations, the two sexes are united in the same flower, which has a 3–5-merous corolla, a corresponding number of stamens or nearly so, inserted at the bottom of the tube, and a style divided above into two branches, one of which may be a little smaller than the other or even disappear altogether. The compound fruit is formed of monospermous capsules, dehiscing in a manner quite peculiar (fig. 242–245). In the other *Opercularias*, the flowers are more numerous and polygamous, but the capsules are the same and open in the same manner, though generally more numerous in each compound fruit. All the *Opercularias* are Australian, herbaceous or subshrubby, sometimes climbing, often of a fœtid odour, with opposite rarely

verticillate leaves, stipulate. The inflorescences are terminal, pedunculate, sometimes grouped in umbelliform cymes. Under the name of *Eleuthranthes* has been described a small Australian herb

Opercularia (*Pomax*) *umbellata.*

Fig. 240. Bifloral inflorescence (⅔).

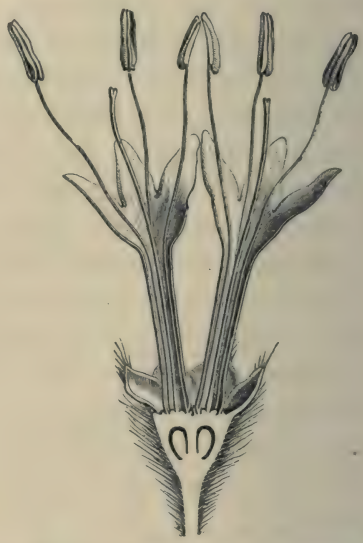

Fig. 241. Long. sect. of inflorescence.

whose characters are nearly those of *Opercularia* and the ovary likewise reduced to a single uniovulate cell, but the flowers, instead of being united by the receptacles, are quite independent to the

Opercularia aspera.

Fig. 242. Compound fruit operculum detaching (⅔).

Fig. 244. Single fruit.

Fig. 245. Long. sect. of single fruit.

Fig. 243. Operculum bearing several fruits ((⅔).

base. They are collected in false capitules which are in reality compound glomerules.

Whilst in the small group of *Opercularieæ*, the number of ovarian

cells is reduced to one, in another genus, ordinarily placed in a distinct group, *Hamiltonia*, the number of ovarian cells becomes equal to that of the divisions of the corolla, to which they are superposed. The flowers of *Hamiltonia* are otherwise those of *Serissa*, the lobes of the corolla being valvate or induplicate. The style is divided into five stigmatiferous branches. The ovarian cells enclose each an ovule inserted quite at the base of the internal angle, with the micropyle inferior and exterior, and the fruit opens in five valves which, separating from top to bottom, expose each a sort of reticulated sac enveloping the seed. They are Asiatic shrubs with opposite leaves, fœtid odour and flowers in terminal cymes, sometimes very singular. Those distinguished under the generic name of *Leptodermis*, have the style deeply divided in strips; and the reticulated sac which covers the seed remains entire, whilst in *Hamiltonia* proper, it opens in three nearly regular valves at the base. The pannels of the capsule are here detached only in the upper portion, whilst in *Leptodermis* they separate from the base (fig. 246, 247).

Hamiltonia (*Leptodermis*) *lanceolata.*

Fig. 246. Portion of fruit, surmounted by the calyx.

Fig. 247. Seed surrounded by reticulated sac of the endocarp.

Beside the preceding has been placed, with some doubt, *Pseudopyxis depressa*, a small Japanese herb, in the flowers of which all the verticils are ordinarily pentamerous and the inferior ovary is surmounted by a cupule lined with a glandular disk. At the margin of the latter are inserted the perianth of five lanceolate sepals, and a funnel-shaped corolla with five pointed valvate lobes. In each ovarian cell is an ovule with micropyle exterior and inferior; and the style, very long and slender, divides into five stigmatiferous branches. The fruit is said to consist of five indehiscent cocci. The flowers are terminal or axillary, and most frequently solitary.

Pœderia has also given name to a separate tribe (*Pœderieæ*), but with us, like *Opercularieæ*, form only a subseries of the *Anthospermeæ*. In *Pœderia* proper (fig. 248–250), from tropical Asia and Africa, the flowers, hermaphrodite or polygamous, 4–6-merous, have a calyx with divisions more or less deep, often reflexed at the summit; a

tubular corolla with limb divided into induplicate-valvate lobes and the re-entering portion fimbriate or wrinkled. The stamens are inserted on the corolla at a variable height; and the gynæcium, dimerous, or more rarely trimerous, is composed of an ovary the cells of which contain each an ovule with micropyle exterior and inferior, surmounted by a style with long and slender stigmatiferous

Pœderia fœtida.

Fig. 248. Fruit (♀).

Fig. 250. Fruit with the two cocci separated.

Fig. 249. Fruit with exocarp detached.

branches. The fruit, more or less compressed, often flattened when dimerous, is composed of thin putamens the seminal cavity of which corresponds to a central thickening and is surrounded by a sort of flattened elliptical frame, often described as a marginal wing. At maturity, these putamens separate from the thin and fragile exocarp which exposes superficially, within and especially without, the very distinctly marked fibro-vascular fascicles with which the portion formerly fleshy is traversed (fig. 249, 250). *Siphomeris* and *Lygodisodea*, the latter American, are only *Pœderia* with some unimportant differences. Except *Lygodisodea*, these plants belong to the tropical regions of the old world. All are climbing or volubile, with opposite or rarely verticillate leaves and interpetiolar stipules ordinarily caducous; all have flowers in compound axillary or terminal cymes, very variable in form, in the length of the axes and in the configuration of their bracts, and often becoming uniparous in their ultimate divisions.

IV. COFFEE SERIES.

The Coffees [1] (fig. 251–256) have regular hermaphrodite flowers. The concave receptacle, enclosing the ovary, bears on its margin a

Coffea arabica.

Fig. 251. Habit ($\frac{1}{20}$).

Fig. 252. Long-styled flower ($\frac{2}{1}$).

Fig. 253. Long. sect. of flower.

short gamosepalous calyx of five divisions generally little promi-

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[1] *Coffea* L. *Gen.* n. 230.—J. *Gen.* 294; *Mém. Mus.* vi. 379.—Gærtn. *Fruct.* i. 118, t. 25, fig. 2.—Lamk. *Dict.* i. 549; Suppl. ii. 12 (part); *Ill.* t. 160.—A. Rich. *Rub.* 88, t. 6, fig. 2.—DC. *Prodr.* iv. 498 (part).—Turp. *Dict. Sc. Nat.* Atl. t. 99.—Endl. *Gen.* n. 3152.—March. *Adansonia,*

nent,[1] sometimes nil, and a hypocrateriform or infundibuliform corolla, glabrous or hairy in the throat, with a limb divided into four

Coffea arabica.

Fig. 254. Fructiferous branch ($\frac{1}{2}$).

or five[2] lobes twisted in the bud. The stamens,[3] alternate, are composed of a filament, generally short, attached to the throat of the corolla or in the sinus of its divisions, and supports a dorsifixed

v. 17, t. 1bis–4.—B. H. *Gen.* ii. 114, n. 238.—Baker, *Fl. Maurit.* 152.—*Coffe* Ray, *Hist. Pl.* ii. 1691.—*Cofea* Adans. *Fam. des Pl.* ii. 145 (1763).

[1] Often accompanied by a bed of waxy matter covering the top of the bud and secreted in abundance between it and the surrounding bracts.

[2] There may be six.

[3] Dimorphous in *C. arabica* and others.

introrse anther,[1] with two narrow cells dehiscing within or near the margin, enclosed or exserted. The gynæcium is composed of an inferior ovary, ordinarily bilocular,[2] surmounted by a thick epigynous disk, and a style, enclosed or exserted, the extremity of which divides into two narrow branches, straight or recurved, charged internally with stigmatic papillæ. In the internal angle of each cell, at a variable height, is inserted a peltate ovule, incompletely anatropous, with micropyle directed downwards and outwards.[3] The fruit is an oblong or spherical drupe, with flesh more or less thick, enclosing one or two putamens, thin and parchment-like, or thicker and resisting, externally convex and flat within if two in number. There a more or less deep vertical furrow presents itself which is seen reproduced on the internal face of the seed. The latter has, under a thin coat, a horny albumen, more or less involute at the margin, and an eccentric dorsal embryo near the base of the albumen (fig. 256). The cotyledons are foliaceous, elliptical or cordate, and the radicle, rather long, is inferior. The Coffee plants are shrubs of tropical Asia and Africa, with opposite or ternate leaves, accompanied by interpetiolar, or oftener intrapetiolar stipules, connate in a sheath to a variable extent and generally acuminate.[4] The flowers[5] are united in the axil of the leaves in contracted compound cymes, with pedicels rarely a little developed, accompanied with bracts and bracteoles, often connate, ordinarily covered, like the young leaves and the stipules which they resemble, with a waxy or sticky and resinous substance.

Coffea arabica.

Fig. 255. Trans. sect. of fruit.

Fig. 256. Trans. sect. of fruit, showing embryo.

From the Coffees has been distinguished generically *Lachnostoma*,[6] a shrub of Sumatra, having the corolla charged with abundant hairs in the throat, ordinarily four-lobed, a style with slender branches, an

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[1] The connective is curved in *C. arabica*, and the summit of the filament is inserted on its back, but remaining rigid; so that the anther does not become oscillating.

[2] It is sometimes trilocular.

[3] Covered with a thick placentary obturator.

[4] In the interior are found soft papillæ, or glandular sticks, which secrete an abundant waxy substance, as around the buds.

[5] Rather large, white, odorous.

[6] Korth. *Ned. Kruidk. Arch.* ii. 202 (*Lachnastoma*).—B. H. *Gen.* ii. 114, 1129, n. 237 (not H. B. K.).

ovule very incompletely anatropous and flowers with short pedicels bearing bracteoles connate in a calycule; we make it only a section of *Coffea*. The same course perhaps should be adopted with *Leio-*

Ixora (*Pavetta*) *indica*.

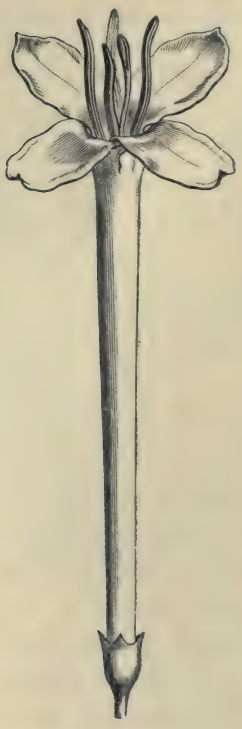

Fig. 257. Flower (§).

Fig. 259. Long. sect. of base of flower ($\frac{12}{1}$).

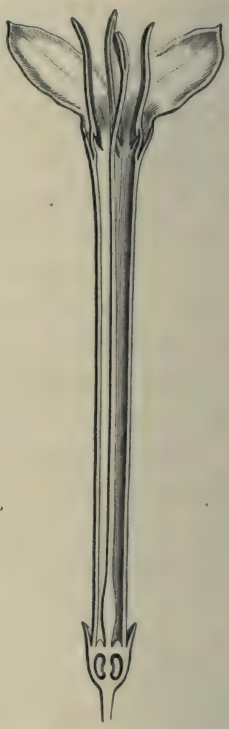

Fig. 258. Long. sect. of flower.

chilus, a shrub of Madagascar, whose flowers are nearly those of a Coffee, but the style-branches are thicker and more obtuse; the fruit is a thicker putamen with two or sometimes three cells; and the very small flowers in axillary cymes bear on their pedicels one or several pairs of connate bracts forming false calycules.

Psilanthus is also very near *Coffea*, and its pentamerous flowers with contorted corolla are equally axillary but solitary. The ovary, with two uniovulate cells, is surmounted by a long and slender style with two linear stigmatiferous branches. The fruit is drupaceous, but little fleshy, and the five divisions of the calyx grow, after floration, into large persistent lanceolate folioles. It is a shrub of the

island of Fernando-Po, with triangular intrapetiolar stipules, and rather large flowers.

Ixora (fig. 257–259), which has given name (*Ixoreæ*) to this group, often has a flower very analogous to that of *Coffea* and a fruit with two putamens. The calyx has four or five short teeth; but in those named *Pavetta* the divisions may be much elongated. In the latter the style is very long, exserted, the upper extremity often tapering,

Strumpfia maritima.

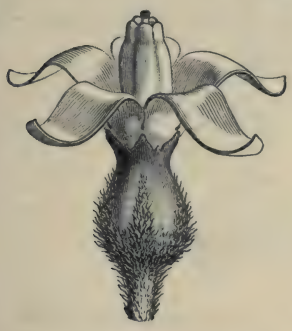

Fig. 260. Flower ($\frac{4}{1}$).

Fig. 261. Long. sect. of flower.

whilst in the true *Ixoras* this extremity is generally divided into two branches, ordinarily independent. The calycinal divisions are short or nil in *Myonima* which has two to four ovarian cells, the same number of stylary divisions and as many putamens in the drupe. These calycinal divisions most frequently fall early in *Rutidea*, whose style tapers towards the summit, but the albumen becomes ruminate. It is equally so in certain species of *Pavetta*, from tropical eastern, continental and insular Africa, named *Enterospermum*, the leaves of which become black by desiccation, and which have, moreover, a variable number of ovules. When the true *Ixora* has only one in each cell, there is ordinarily in the internal angle of the latter a salient placenta, in which the ovule, incompletely anatropous, with inferior micropyle, is more or less imbedded. In *Enterospermum*, there are one, two, three or more of these placentary indentations containing an ovule. It is the same in *Tarenna*, in which the number of ovules may be still greater, and the albumen is continuous and not ruminate; they are from Oceania, tropical Asia and Africa. Among the latter are *Ixoras* whose ovule becomes slightly descending instead of ascending. The fact is much more frequent and more marked in

Siderodendron, American *Ixoras* in which the raphe may be dorsal, the micropyle directed upwards and inwards. The plants of this genus have flowers in cymes, often umbelliform or corymbiform, terminal, more rarely axillary or lateral.

We place here doubtfully and as an abnormal type, *Strumpfia maritima* (fig. 260, 261), whose bilocular ovary is that of a *Coffea*, but whose corolla is imbricate instead of being contorted, and whose stamens are monadelphous and syngenesious, whilst the style is undivided at the summit. It is a small shrub growing on the maritime rocks of the Antilles; its small leaves are ternate, and the flowers are united in small axillary clusters.

V. URAGOGA SERIES.

The plant which produces the common Ipecacuanha[1] received from Linnæus, in 1737, the generic name of *Uragoga*.[2] Its flowers (fig. 262–265) are hermaphrodite, regular and ordinarily pentamerous. The receptacle is in the form of a concave sac the margin of which bears the perianth and the cavity contains the ovary. The calyx is gamosepalous, with five divisions[3] which soon cease to touch, and the corolla, almost funnel-shaped, is divided above into five lobes valvate[4] in prefloration. On its hairy throat are inserted five stamens, alternate with its divisions. They are formed each of a short filament and an introrse dorsifixed bilocular anther dehiscing by two longitudinal clefts.[5] The ovary, inferior, has two cells, anterior and posterior; it is surmounted by a glandular epigynous entire or bilobed disk, and a style the stigmatiferous extremity of which is divided into two lanceolate-subulate branches. In the internal angle of each ovarian cell is inserted, near the base, an ascending anatropous ovule with ventral raphe and micropyle directed downwards and out-

[1] That is the smaller curled *Ipecacuanha*.

[2] *Gen.* (ed. 1) 378, n. 934 (1737).—H. Bn. *Adansonia*, xii. 324.

[3] Often unequal, ciliate.

[4] Inflexed at the summit and almost fleshy.

[5] The cells are independent below. The pollen is white. According to H. Mohl, in *Cephælis* (*Ann. Sc. Nat.* ser. 2, iii. 323) it is "ellipsoid; three folds; in water spherical; three bands and three umbilics."

wards.[1] The fruit is a drupe with two putamens of little thickness enclosing each an ascending seed, the coats of which, traversed medially by a longitudinal furrow, cover a hard albumen enveloping

Uragoga Ipecacuanha.

Fig. 262. Habit (½).

a short axile embryo with inferior radicle and foliaceous cotyledons. *Uragoga Ipecacuanha* (fig. 262) is a low creeping plant of tropical America chiefly of Brazil. Its roots, often thick, cylindrical transversely ringed, constitute the medicine known as ringed *Ipecacuanha*. Its frutescent aerial branches, generally not ramified, bear opposite, penninerved leaves accompanied with interpetiolar stipules, united at the base and forming a short sheath ciliate at the margin; and its

[1] There is but one coat, and this is ordinarily very rudimentary.

flowers[1] are collected in a terminal false capitule of glomerules or cymes with very short pedicels, the whole accompanied with two pairs of rather large decussate bracts forming an involucre (fig. 263).

Little consistent as are the stems of the preceding plant, there are congeners from nearly the same countries with still softer stems.

Uragoga Ipecacuanha.

Fig. 264. Flower.

Fig. 263. Inflorescence (⅔).

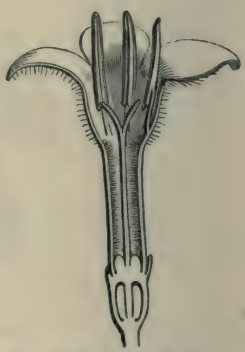

Fig. 265. Long. sect. of flower.

They are creeping herbs implanting themselves in the soil by their adventitious roots. Aublet named some *Tapogomea*[2] and ranged others in the great genus *Psychotria* of Linnæus.[3] More recently the name *Geophila*[4] has been given to the creeping and rooting herbaceous species of *Psychotria;* they are abundant in all the tropical regions of both worlds.

The woody *Uragogas*, also abundant in the same regions, especially the tropical, vary: 1. in the position of their inflorescences, which may be axillary,[5] instead of terminal, pedunculate or sessile, and may

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[1] Small, white, nearly inodorous.

[2] *Guian.* i. 157, t. 60–63 (1775).—*Carapichea* Aubl. *loc. cit.* 167, t. 64.—Endl. *Gen.* n. 3141.—*Eurhotia* Neck. *Elem.* i. 207.—*Callicocca* Schreb. *Gen.* i. 126.—Brot. *Trans. Linn. Soc.* vi. 137.—*Cephælis* Sw. *Prodr.* 45 (1788); *Fl. Ind. Occ.* 435, t. 10.—A. Rich. *Diss. Ipec.* 21, t. 1; *Rub.* 92.—J. *Mém. Mus.* vi. 402.—DC. *Prodr.* iv. 532.—Endl. *Gen.* n. 3140.—B. H. *Gen.* ii. 127, n. 270 (*Japogomea*), 1229.—Hook. *Fl. Ind.* iii. 178.—*Cephaleis* Vahl, *Ecl.* i. 19.

[3] *Gen.* (ed. 6) n. 229 (1764).—J. *Gen.* 204.—Gærtn. *Fruct.* i. 120, t. 25.—DC. *Prodr.* iv. 504.—Rich. *Rub.* 91.—Endl. *Gen.* n. 3147.—B. H. *Gen.* ii. 123, n. 263.—*Myrstiphyllum* P. Br. *Hist. Jam.* 152.—*Psychotrophum* P. Br. *loc. cit.* 160, t. 17, fig. 2.—*Chasallia* Commers. ex J. *Mém. Mus.* vi. 379.—Rich. *Rub.* 86, t. 6, fig. 1.—*Chasalia* DC. *Prodr.* iv. 531.—Endl. *Gen.* n. 3145.—B. H. *Gen.* ii. 126, n. 266.—Baker, *Fl. Maurit.* 153.—Hook. *Fl. Ind.* iii. 176.—*Polyozus* Bl. *Bijdr.* 947 (part, not Lour.).—? *Hylacium* P. Beauv. *Fl. Ow.* ii. 83, t. 113.—*Zwaardekronia* Korth. *Ned. Kruidk. Arch.* ii. 245.

[4] Don, *Prodr. Fl. Nepal.* 136.—DC. *Prodr.* iv. 537.—Endl. *Gen.* n. 3139.—B. H. *Gen.* ii. 127, n. 269.—Hook. *Fl. Ind.* iii. 177.

[5] Notably so in *Evea* Aubl. (*Guian.* 100, t. 39) which can only form a section of this genus.

even form a false verticil at the axils of the leaves as in the *Labieæ;*[1] 2. in the proportions of the involucre the bracts of which are sometimes short, sometimes large foliaceous imbricate; here green, there coloured in various ways; in some cases entire, in others much divided and pinnatifid as, for example, in the herbaceous *Uragogas* of tropical Africa, whose inflorescences are terminal and which have been named *Trichostachys;*[2] 3. in the dimensions of the calyx which may be short, entire or dentate, or large, foliaceous, more or less closely imbricate in prefloration; 4. in their interpetiolar stipules which are sometimes united, sometimes more or less free, entire or ciliate, dentate, or sometimes large and coriaceous as in the African species named *Camptopus.*[3] Other characters also very variable are the form of the stigmatiferous divisions of the style which are more or less wide, thick, united or independent, clothed with papillæ, proximate, exposed or reflexed; and the form of the epigynous disk which is simple or consisting of two lobes or of two glands superposed to the ovarian cells, depressed or hemispherical, or conical and more or less raised. Several species also have polygamous or dicœcious flowers. We shall also see that in this type the form of the putamens and of the seeds may present very numerous variations as we pass from one species to another.

In the woody and generally larger *Uragogas* which have been more especially ranged in the genus *Psychotria*, the inflorescences are also sometimes in capitules of cymes and the involucres are formed of imbricate bracts, ordinarily long and narrow, sometimes coloured. They have been named *Patabea.*[4] If, on the other hand, while the bracts remain large and here and there coloured, or become small and green, the axes of the compound or mixed inflorescence are more or less elongated, so that it becomes a simple or, more generally, a ramified cluster of cymes, we have the true *Psychotria* of authors, which may also present, in the perianth, in the disk, in the gynæcium, all the variations observed among the *Uragogas* with sessile flowers. Hence arise a multitude of sections, usually considered independent genera, which are here passed in review :—

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[1] Sect. 2. *Axillares* (B. H. *Gen.* ii. 128).
[2] Hook. f. *Gen.* ii. 128, n. 271.
[3] Hook. f. *Bot. Mag.* t. 5755.
[4] Aubl. *Guian.* i. 110, t. 43.—J. *Mém. Mus.* vi. 401 (part).—Lamk. *Ill.* t. 65.—DC. *Prodr.* iv. 537.—Endl. *Gen.* n. 3142.

Ronabea[1] comprises *Psychotrias* whose inflorescences are axillary; they are compound cymes, either very short or longer and ramified.

Rudgea[2] comprises *Psychotrias* whose limb is 4–10-dentate and corolla, often hairy externally, is divided into four or five straight or incurved lobes, often bearing, a little below the summit, a sort of full conical horn, more or less prominent, and whose very wide seed is usually involute at the face.

Palicourea,[3] very similar to *Rudgea* in other characters, has a straight or curved corolla, sometimes gibbous at the base, and ovarian cells varying from two to five in number.[4]

Psathura,[5] shrubs of Madagascar, consists of *Psychotrias* with 4–6-merous flowers, whose ovary has 2–6 cells. When they are the same in number as the sepals, they alternate with them. The inflorescences, composed of cymes, are frequently axillary; but they may also have solitary flowers.

Triainolepis[6] has 4–7-merous flowers with a 4–7-celled ovary like that of *Psathura;* but the compound cymes are invariably terminal.

Strempelia[7] comprises *Psychotrias* of both worlds whose ciliate stipules have a truncate summit as in *Rudgea*, and whose floral cymes are umbelliform.

Grumilea[8] includes old world *Psychotrias* the albumen of whose seeds is more or less deeply ruminate.

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[1] Aubl. *Guian.* i. 154, t. 59.—J. *Gen.* 205.—Rich. *Rub.* 90.—DC. *Prodr.* iv. 503.—Endl. *Gen.* n. 3148.

[2] Salisb. *Trans. Linn. Soc.* viii. 327, t. 18, 19.—Rich. *Rub.* 89.—DC. *Prodr.* iv. 503.—Endl. *Gen.* n. 3151.—B. H. *Gen.* ii. 125, n. 265.—? *Encopea* Presl. *Bot. Bem.* 83.—? *Pachysanthus* Presl. *Bot. Bem.* 87. — ? *Gloneria* Lind. et André, *Ill. Hort.* xviii. 76, t. 60.—B. H. *Gen.* ii. 51, 1228, n. 65.

[3] Aubl. *Guian.* i. 172, t. 66.—Rich. *Rub.* 94.—DC. *Prodr.* iv. 524.—B. H. *Gen.* ii. 125, n. 264.—*Nonatelia* Aubl. *Guian.* 182, t. 70.—DC. *Prodr.* iv. 466.—Endl. *Gen.* n. 3209.—*Oribasia* Schreb. *Gen.* 123, n. 307.—*Galvania* Vandell. *Fl. Lus. et Bras.* 15, t. 1, fig. 7; *Rœm. Scr.* 89, t. 6, fig. 7.—*Stephanium* Schreb. *Gen.* 124.—*Colladonia* Spreng. *Syst. Veg.* i. 516.

[4] There are often from three to five cells in *Psychotria parasitica*, &c. of which we have made the section *Viscagoga* (*Adansonia*, xii. 227), and which are in fact American parasitic plants with the leaves of *Loranthus* and terminal and axillary inflorescences.

[5] Commers. ex J. *Gen.* 206.—Gærtn. *Fruct.* iii. 82, t. 194.—Lamk. *Ill.* t. 260.—DC. *Prodr.* iv. 462.—Rich. *Rub.* 134.—Endl. *Gen.* n. 3200 (*Psathyra*).—B. H. *Gen.* ii. 132, n. 282.—H. Bn. *Adansonia*, xii. 328.—Baker, *Fl. Maurit.* 156.

[6] Hook. f. *Gen.* ii. 126, n. 267.—Hiern, *Fl. Trop. Afr.* iii. 219.—H. Bn. *Adansonia*, xii. 325.

[7] A. Rich. *Rub.* 100.—DC. *Prodr.* iv. 498.—Endl. *Gen.* n. 3153.

[8] Gærtn. *Fruct.* i. 138, t. 28, fig. 2.—DC. *Prodr.* iv. 495.—Endl. *Gen.* n. 3156.—Hiern, *Fl. Trop. Afr.* iii. 215.—H. Bn. *Adansonia*, xii. 335.

Streblosa[1] is a climbing *Psychotria* of the Indian Archipelago, with leaves slightly hairy, whose corolla is said to be slightly imbricate; but we have always seen it valvate.

Mapouria[2] comprises *Psychotrias* in which the face of the albumen is neither traversed by a vertical furrow, nor concave, nor involute, but flat or nearly so. The large caducous stipules are often membranous.[3]

Straussia[4] consists of Oceanic *Psychotrias*, with long-pedunculate cymes, short articulate pedicels, and basifixed anthers.

Parastraussia,[5] also Oceanic, has flowers united in loose cymes, with an obconical, depressed ovary, a short campanulate calyx, a short corolla, much depressed in the bud, covered with silky hairs, and stamens inserted between the lobes of the corolla.

Cleisocratera[6] is a *Psychotria* of Borneo, with "leaves slightly serrulate," tetramerous flowers united in slender terminal cymes and dentate calyx.

Proscephalium[7] is a Javan *Psychotria*, said to be "pseudo-parasitic," the pentamerous flowers of which have a thick pedicel, a bilocular ovary and a style with a large stigmatiferous head, obtusely bilobed.

Calycosia,[8] Oceanic *Psychotrias* whose calyx, often caducous, is usually developed into a rather large membranous 5-fid horn. The terminal inflorescences are cymes which may contract and consequently resemble capitules.

Suteria[9] has also a calyx in the form of a bell or dilated tube, particularly in *Codonocalyx*,[10] where it is divided above into five wide lobes. The flowers are in terminal or oftener axillary cymes, and

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[1] Korth. *Ned. Kruidk. Arch.* ii. 245.—Miq. *Ann. Mus. Lugd.-Bat.* iv. 211, 262.—H. Bn. *Adansonia*, xii. 325.

[2] Aubl. *Guian.* 175, t. 67.—Rich. *Rub.* 93.—Endl. *Gen.* n. 3149.—Benth. *Œrst. Rub. Centroamer.* 10.—M. Arg. *Flora* (1875), 457.—*Simira* Aubl. *loc. cit.* i. 170, t. 65.

[3] In *U. viburnifolia*, of Mexico, which we have made a section *Opulagoga* (*Adansonia*, xii. 330), the wide and membranous caducous stipules at first completely envelope the terminal cymes. The lobes of the corolla are corniculate as in *Rudgea;* the leaves are crenelate and covered with a whitish down.

[4] DC. *Prodr.* iv. 502 (*Coffeæ* sect. 4).—A. Gray, *Proc. Amer. Acad.* iv. 43.—B. H. *Gen.* ii. 122, n. 260.—H. Bn. *Adansonia*, xii. 327.

[5] H. Bn. *Adansonia*, xii. 251, 329 (New Caledonian species).

[6] Korth. *Verh. Nat. Geschied.* 256, t. 62.—B. H. *Gen.* ii. 123, n. 262.—H. Bn. *Adansonia*, xii. 327.

[7] Korth. *Ned. Kruidk. Arch.* ii. 248.—B. H. *Gen.* ii. 122, n. 261.—H. Bn. *Adansonia*, xii. 327.

[8] A. Gray, *Proc. Amer. Acad.* iv. 48.—Seem. *Fl. Vit.* 133.—B. H. *Gen.* ii. 122, n. 259.—H. Bn. *Adansonia*, xii. 326.

[9] DC. *Prodr.* iv. 536.—Endl. *Gen.* n. 3144.—B. H. *Gen.* ii. 130, n. 276.—H. Bn. *Adansonia*, xii. 326.

[10] Miers, *Lindl. Veg. Kingd.* 764 (not Bl.).—Lindl. *Collect.* t. 21 (*Cephælis*).

they are also often solitary at the ends of the branches or in the axil of the leaves; they are American species.

Amaracarpus[1] has all its flowers axillary, solitary or few, tetramerous and with bilocular ovary; in other respects they are the flowers of *Psychotria* more or less enveloped by stipuliform bracts forming an involucre. They are shrubs of Java. There is one in the Marian Isles whose flowers, axillary, are rather numerous in each glomerule.

Pyramidura[2] comprises New Caledonian *Uragogas* whose fruit is angular, with salient vertical ridges like narrow wings. In *Stauragoga*,[3] a Marian species, these wings are much more developed, but there are only two to each carpel, so that the transverse section of the fruit, as in most *Mulineæ*, has the form of a St. Andrew's cross.

Forcipella[4] consists of New Caledonian *Uragogas* whose carpels, furnished with ridges, are united by a sort of columella with two branches, corresponding to the interval between the margins, themselves forked in two divisions.

In *Apodagoga*,[5] from the same country, the fruit has salient ridges, but, like the flowers, they are nearly sessile, and the flowers themselves, united in cymes at the ends of the branches, have a long corolla with thick and narrow lobes, and are surrounded by oval or cordate decussate leaves forming an involucre.

The inflorescences are reduced to two or three or even to a single flower in *Oligagoga*, small shrubby species of New Caledonia; but these inflorescences are terminal, whilst in *Tolisanthes*,[6] from the same country, having the same foliage as *Amaracarpus*, the flowers are axillary, solitary, and pedunculate. Hereby this type connects the many-flowered *Uragogas* with terminal inflorescences to *Litosanthes*,[7] a Javan shrub with small leaves which has the tetramerous flowers of *Uragoga*, solitary or geminate on a small common axillary axis and four uniovulate cells in the ovary. *Margaritopsis*,[8] a Cuban shrub, also with small leaves, has the flowers of *Uragoga*, axillary and

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[1] Bl. *Bijdr.* 954.—Rich. *Rub.* 118.—DC. *Prodr.* iv. 472.—Endl. *Gen.* n. 3179.—Miq. *Fl. Ind.-Bat.* ii. 304.—B. H. *Gen.* ii. 130, n. 275.—H. Bn. *Adansonia*, xii. 333.

[2] H. Bn. *Adansonia*, xii. 286.

[3] H. Bn. *loc. cit.* 329.

[4] H. Bn. *loc. cit.* 288.

[5] H. Bn. *loc. cit.* 252, 332.

[6] H. Bn. *loc. cit.* 294.

[7] Bl. *Bijdr.* 994; *Flora* (1825), 129 (*Lithosanthes*).—Rich. *Rub.* 133.—DC. *Prodr.* iv. 465. Endl. *Gen.* n. 3206 (*Lithosanthes*).—B. H. *Gen.* ii. 131, n. 279.—H. Bn. *Adansonia*, xii. 334.

[8] C. Wright, *Sauv. Fl. Cub.* 68.—B. H. *Gen.* ii. 133, 1229, n. 285.—H. Bn. *Adansonia*, xii. 334. - *Margaris* Gris. *Cat. Pl. Cub.* 134 (not DC.).

terminal, solitary and supported on a short peduncle; but the ovary has only two uniovulate cells, and the small drupe has only two putamens as in most *Uragogas*.

Thus defined,[1] the genus *Uragoga* numbers at least eight hundred species[2] belonging to all the tropical and subtropical regions of the globe;[3] many are still little known.

Beside *Uragoga* are placed *Declieuxia*, *Lasianthus*, *Saprosma* and *Myrmecodia*. All have a valvate corolla, uniovulate ovarian cells, with an ovule similar to that of *Uragoga*. All have drupaceous fruit and ascending albuminous seeds. *Declieuxia*, American herbaceous

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[1] Sect. 34: 1. *Euuragoga* (*Tapogomea*, *Cephælis*, &c.); 2. *Geophila* (Don); 3. *Podocephœlis* (H. Bn.); 4. *Trichostachys* (H. f.); 5. *Chasallia* (Commers.); 6. *Ronabea* (Aubl.); 7. *Patabea* (Aubl.); 8. *Palicourea* (Aubl.); 9. *Nonatelia* (Aubl.); 10. *Rudgea* (Salisb.); 11. *Viscagoga* (H. Bn.); 12. *Psychotria* (L.); 13? *Streblosa* (Korth.); 14. *Strempelia* (Rich.); 15. *Simiria* (Aubl.); 16? *Mapouria* (Aubl.); 17. *Opulagoga* (H. Bn.); 18. *Grumilea* (Gærtn.); 19. *Pyramidura* (H. Bn.); 20. *Proscephalium* (Korth.); 21. *Cleisocratera* (Korth.); 22. *Forcipella* (H. Bn.); 23. *Suteria* (DC.); 24. *Calycosia* (A. Gray); 25. *Straussia* (A. Gray); 26. *Apodagoga* (H. Bn.); 27. *Stauragoga* (H. Bn.); 28. *Psathura* (Comm.); 29. *Triainolepis* (H. f.); 30. *Oligagoga* (H. Bn.); 31. *Tolisanthes* (H. Bn.); 32. *Litosanthes* (Bl.); 33. *Amaracarpus* (Bl.); 34. *Margaritopsis* (C. Wr.).

[2] Poir. *Dict.* v. 696; Suppl. iv. 591 (part); *Ill.* t. 161 (*Psychotria*).—H. B. K. *Nov. Gen. et Sp.* t. 282, 283 (*Psychotria*), 285 (*Palicourea*).—Griseb. *Fl. Brit. W.-Ind.* 339 (*Rudgea*, *Ronabea*), 345 (*Palicourea*), 346 (*Cephœlis*); *Cat. Pl. Cub.* 134.—Clos. *C. Gay Fl. Chil.* iii. 197 (*Psychotria*).—M. Arg. *Flora* (1876), 449 (*Rudgea*), 457 (*Mapouria*), 540 (*Psychotria*).—Harv. and Sond. *Fl. Cap.* iii. 21 (*Grumilea*).—Baker, *Fl. Maur.* 153 (*Chasalia*), 155 (*Psychotria*), 156 (*Psathura*).—Hiern, *Fl. Trop. Afr.* iii. 193 (*Psychotria*), 215 (*Grumilea*), 219 (*Triainolepis*), 220 (*Geophila*), 222 (*Cephœlis*), 226 (*Trichostachys*); *Trim. Journ. Bot.* xvi. 263, t. 8 (*Trichostachys*).—Wawr. *Flora* (1875), 328 (*Psychotria*).—Miq. *Fl. Ind.-Bat.* ii. 279 (*Chasalia*), 283 (*Psychotria*), 295 (*Grumilea*), 299 (*Polyozus*), 302 (*Proscephalium*), 303 (*Amaracarpus*), 310 (*Cephœlis*), 311 (*Geophila*), 314 (*Litosanthes*); Suppl. 222, 546 (*Chasalia*), 223, 547 (*Psychotria*), 224 (*Amaracarpus*).—F. Muell. *Fragm.* ix. 184 (*Psychotria*), 187 (*Cephœlis*).—Benth. *Fl. Austral.* iii. 426 (*Psychotria*); *Fl. Hongk.* 161 (*Psychotria*).—Bedd. *Icon. Pl. Ind. Or.* i. t. 236 (*Psychotria*).—Thw. *Enum. Pl. Zeyl.* 147 (*Grumilea*), 148 (*Psychotria*), 150 (*Chasalia*, *Geophila*).—Kurz, *For. Fl. Burm.* ii. 8 (*Psychotria*), 14 (*Chazalia*).—Walp. *Rep.* ii. 469 (*Geophila*), 470 (*Cephœlis*, *Patabea*, *Suteria*), 471 (*Palicourea*, *Psychotria*), 479 (*Grumilea*); vi. 36 (*Cephœlis*, *Patabea*, *Suteria*), 39 (*Palicourea*), 40 (*Psychotria*), 44 (*Grumilea*), 47 (*Cleisocratera*); *Ann.* i. 372, 373 (*Grumilea*); ii. 744 (*Geophila*, *Cephœlis*, *Chasalia*), 745, 746 (*Streblosa*), 747 (*Zwaardekronia*, *Rudgea*), 755 (*Proscephaleium*); v. 107 (*Palicourea*), 108 (*Psychotria*), 114 (*Nonatelia*).

[3] *Mesoptera Maingayi* Hook. f. (*Gen.* ii. 130, n. 277) to us imperfectly known, has the pentamerous flowers of *Uragoga*, with a valvate corolla and uniovulate ovarian cells; ovule ascending, micropyle exterior. It is distinguished by the summit of the style "large stigmatic capitately 10-lobed." We have not seen this organ. It is a tree of Malacca with axillary cymes. Neither can we determine definitively the place of the genus *Thiersia* (fig. 266), which we have proposed (*Adansonia*, xii. 355) for a remarkable tree of Guyana, with branches alternately compressed and phyllodiform. In the axil of these large unsymmetrical leaves, the flowers are united in biparous cymes with stumpy axis bearing under them four bracts, two of which are narrow and acuminate, the two others alternate, wide, membranous, concave or cucullate, each enfolding one of the lateral flowers. The ovary, inferior, is bilocular with a single ascending ovule in each cell, and the corolla is narrow-tubular, 4-lobed, valvate.

or shrubby plants with opposite or verticillate leaves, has flowers in terminal clusters or corymbs of uniparous cymes. The calyx has four sepals, free or united below, of which the two lateral may be larger than the others, or exist alone as in *Congdonia*. The fruit is didymous or heart-shaped, finally dry, and the seeds, compressed, albuminous, enclose a very small claviform embryo. *Lasianthus*, belonging to the tropical regions of the old world and exceptionally to Guyana and the Antilles, consists of shrubs generally hairy, fœtid, with opposite or rarely verticillate leaves. The flowers, which are those of *Uragoga*, are in axillary false verticils (of glomerules), 4–6-merous, with enclosed or slightly exserted stamens, longer exserted (especially in the males) than in those named *Allœophania*. The ovary is of 4–10 cells in the true *Lasianthus*, and bilocular in the Malagash species called *Saldinia*, which we cannot separate generically from *Lasianthus*. *Saprosma* has also opposite or more rarely verticillate leaves. The flowers are sessile or pedicellate, axillary, solitary, ternate or united in ramified cymes. In construction they resemble those *Lasianthus*, with a bilocular ovary, often surrounded at the base with connate bracts forming a small calicule. But the divisions of the corolla are induplicate-valvate and thin in that portion occupying the interior of the bud. They are fœtid shrubs of tropical Asia and Oceania. *Myrmecodia* consists of epiphytal shrubs of a peculiar habit growing in the Indian Archipelago and other parts of tropical Oceania. The rhizome (?), dilated to smooth or embossed or echinate tubercles, is indented with cavities occupied by ants. The opposite leaves are like those of the *Rhizophoreæ* and are accompanied by small or large, caducous or persistent, stipules. The flowers, axillary, solitary or in glomerules, are constructed like those of a *Uragoga* or *Lasianthus*, tetramerous, with a 3–5-celled ovary, 2-celled in those of which the genus *Hydnophytum* has been formed.

Thiersia insignis.

Fig. 266. Three-flowered inflorescence (?).

But the plants which have the most characters in common with

Uragoga, particularly with *Psychotria* and *Chasalia*, are *Gærtnera* and *Pagamea*, usually placed in another family (*Loganiaceæ*). They in reality differ only in the form of the receptacle and the little adherence to it of the ovary which is not quite free, as is often said, but adherent only in its lower portion, corresponding to a part of the ovarian cells. The latter are two in number and enclose a single ovule of *Uragoga*. *Gærtnera* (fig. 267, 268) consists of shrubs of Africa and tropical Asia, abundant especially in the eastern African islands. The fruit is free and drupaceous, and the albumen, very hard, is abundant and homogeneous. *Pagamea* (fig. 269–274), scarcely distinct generically from *Gærtnera*, inhabits eastern tropical America. The inflorescence is axillary; the ovary is bilocular, more rarely 3–5-celled, and the albumen is deeply ruminate, like that of the section *Grumilea* of *Uragoga*.

Gærtnera vaginata.

Fig. 267. Floriferous branch.

Gærtnera vaginata.

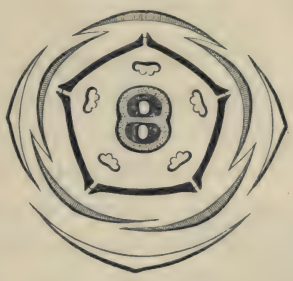

Fig. 268. Diagram.

Two genera, somewhat abnormal, have been ranged in this group near *Uragoga* and *Lasianthus*. One is *Hymenocnemis*, a shrub of Madagascar, with small leaves whose stipules are connate in a sort of spathe which surrounds the summit of the branch and allows it to perforate its extremity so as to form a tubular sheath. Its flowers are nearly those of a *Uragoga*, rather large, axillary and solitary. The other is *Fergusonia*, an Indian herb whose foliage is that of a *Spermacoce* and its axillary flowers

closely resemble those of the section *Allæophania* of *Lasianthus*. They are tetramerous, with an ovary enclosing four uniovulate cavities, surmounted by a disk with four lobes and a style said to

Pagamea guianensis.

Fig. 269. Flower (♮).

Fig. 271. Gynæcium.

Fig. 270. Long. sect. of flower.

Fig. 272. Fruit.

Fig. 274. Seed.

Fig. 273. Long. sect. of dispermous seed.

have only two branches. The fruit is composed of four cocci, surmounted each by one of the divisions of the calyx.

A separate tribe (*Coussareæ*) has been made of *Coussarea*, *Faramea*, and *Homaloclados*, which belong all to one and the same genus differing from *Uragoga* in only one important character, viz. the little development of the interlocular partition which may be wanting above or disappear altogether. The ovules, also, belonging to the two different cells may even touch each other to a variable extent. In the true *Coussarea*, they are supported by a very short common erect column. The calyx is gamosepalous, entire, truncate or 4-dentate. In those named *Faramea*, the calyx presents the same variations, or is almost nil; but the column supporting the ovules

disappears entirely or nearly so; they then generally stand erect and parallel from the bottom of the single ovarian cavity. In the section *Homaloclados*, the calyx becomes larger, gamosepalous, with obtuse or even foliaceous lobes. The plants of this section are then to *Faramea* what *Calycosia* and *Codonocalyx* are to the true *Uragoga*, from which it is difficult to distinguish them when the interlocular partition is somewhat developed. These are all woody or sub-shrubby plants from tropical America.

VI. MORINDA SERIES.

Morinda[1] (fig. 275, 276) has hermaphrodite or more rarely polygamous flowers. These flowers are similar in construction to those of *Uragoga*, usually 4, 5-merous, rarely more. The receptacle, in the form of a small sac, is connate with those of the adjacent flowers, the whole forming only one mass; in the cavity is lodged the ovary, which, instead of a single ovule in each of its two cells, generally encloses two, collateral, ascending,[2] more or less completely anatropous, with the micropyle turned downwards and outwards. The calyx, superior, is entire or more or less deeply divided; the corolla is valvate;[3] the stamens, inserted near the hairy or glabrous throat, or lower,[4] have a dorsifixed introrse anther, enclosed or exserted; the epigynous disk varies in form and appearance, and the style is divided above into two stigmatiferous lobes or branches. In the greater number of species,[5] a false vertical partition, developed in each ovarian cell, between the two ovules, divides it into two

[1] Vaill. *Act. Acad. Par.* (1722) 275.—L. *Gen.* n. 235.—J. *Gen.* 209; *Mém. Mus.* vi. 402.—Lamk. *Ill.* t. 153.—Poir. *Dict.* iv. 313; Suppl. iv. 3.—Gærtn. *Fruct.* i. t. 29.—Rich. *Rub.* 131.—DC. *Prodr.* iv. 446.—Endl. *Gen.* n. 3183.—B. H. *Gen.* ii. 117, t. 246.—H. Bn. *Bull. Soc. Linn. Par.* 205.—Baker, *Fl. Maurit.* 152.—Hook. *Fl. Ind.* iii. 155.—*Roioc* Plum. *Gen.* 11, t. 26.—*Sphærophora* Bl. *Mus. Lugd.-Bat.* i. 179, fig. 36.

[2] Inserted more or less low according as they are more or less completely anatropous.

[3] The folioles may be free or nearly so, and some species in the section *Chorimorinda* (H. Bn. *Adansonia*, xii. 232) are almost completely polypetalous.

[4] When the petals are free or nearly so, the insertion is lower towards the receptacle; but, in this case, the filament often remains united to one of the parts of the corolla, with which it alternates.

[5] But not in all; the false partition is also often very incomplete.

uniovulate half-cells; so that in the mass of compound fruit (or syncarp), capituliform and externally fleshy, are found here and there, groups of four small monospermous putamens or 4-locellate and 4-spermous putamens. The ascending seeds, under a thin coat, enclose a hard or fleshy albumen, surrounding a cylindrical embryo with inferior radicle. *Morinda* consists of trees or shrubs, erect or

Morinda citrifolia.

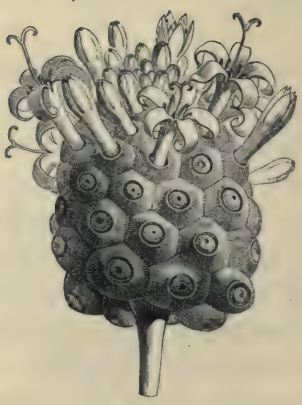

Fig. 275. Inflorescence.

Fig. 276. Compound fruit.

climbing, having opposite leaves, rarely verticillate by threes, with interpetiolar stipules, often connate with the base of the petioles. The flowers [1] are generally in glomerules, united in a sort of head called a capitule.[2] The inflorescences are axillary or terminal, pedunculate or more rarely sessile, solitary or geminate, sometimes united in a sort of umbel or false corymb.

There are *Morindas* with floral glomerules inserted directly in the axil of the leaves, resembling the false verticils of the *Labiœ*. We

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[1] White, odorous in most species, small or moderate.

[2] Wrongly, for it is a mixed inflorescence, like that of the true *Uragogas*, &c.

have named them *Morindella*;[1] they are found in Madagascar and New Caledonia.

In *Imantina*,[2] also inhabiting New Caledonia, these axillary glomerules are borne by a common peduncle; they are often composed of only two or three connate flowers, and even these may be solitary at the end of the peduncle.

In *Rennellia*,[3] native of Malaya and the Indian Archipelago, the glomerules are united so as to resemble a compound spike, on a common thick terminal axis; and there is only one ascending ovule in each ovarian cell instead of two.

Tribrachya,[4] like *Rennellia*, is *Morinda* with uniovulate cells; the flowers are in a loose terminal compound cluster, each axis of which bears a small cyme of three flowers connate by their ovaries. It is a native of Sumatra.

In *Dibrachya*,[5] from Borneo, each glomerule is formed of only two connate flowers. As in *Tribrachya*, the lobes of the corolla are thick and very pointed, and the ovarian cells are uniovulate.

Thus defined,[6] the genus *Morinda* comprises about sixty species,[7] from all tropical regions, rare, however, in America.

Appunia may be defined as an American *Morinda* with biovulate cells, whose flowers, united in a false capitule of cymes at the end of a common axillary peduncle, have free, not connate, ovaries.

In *Cœlospermum*, inhabiting tropical Asia and Oceania, the flowers are not only independent but pedicellate, articulate on the pedicels, and the latter united in compound umbelliform cymes. The ovarian

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[1] *Adansonia*, xii. 231, n. 191. In our section *Morindina* (*loc. cit.* n. 190), the flowers are also sessile and axillary and the cells are biovulate.

[2] Hook. f. *Gen.* ii. 120, n. 155.—H. Bn. *Bull. Soc. Linn. Par.* 202.

[3] Korth. *Ned. Kruidk. Arch.* ii. 255.—B. H. *Gen.* ii. 118, n. 2 47.—Hook. *l. Ind.* iii. 158.

[4] Korth. *Ned. Kruidk. Arch.* ii. 254.—B. H. *Gen.* ii. 118, n. 248.—H. Bn. *Bull. Soc. Linn. Par.* 205.

[5] H. Bn. *Bull. Soc. Linn. Par.* 205.

[6] Sect. 9: 1. *Roioc* (Plum.); 2. *Phyllireastrum* (DC.); 3. *Padavara* (Rheed.); 4. *Chorimorinda* (H. Bn.); 5. *Morindina* (H. Bn.); 6. *Morindella* (H. Bn.); 7. *Rennellia* (Korth.); 8. *Tribrachya* (Korth.); 9. *Dibrachya* (H. Bn.).

[7] P. Br. *Jam.* (1756) 159 (*Morenda*).—Jacq. *Hort. Vindob.* t. 16.—Roxb. *Pl. Corom.* t. 237.—Wight, *Ill.* t. 126.—A. Gray, *Proc. Amer. Acad.* iv. 41.—Labill. *Sert. Austro-Caled.* t. 49.—Bedd. *Fl. Sylv.* t. 220.—Miq. *Fl. Ind.-Bat.* ii. 242, 247 (*Tribrachya*), 248 (*Rennellia*); Suppl. 220, 543.—F. Muell. *Fragm.* ix. 179.—Benth. *Fl. Austral.* iii. 423; *Fl. Hongkong.* 159.—Thw. *Enum. Pl. Zeyl.* 144.—Seem. *Fl. Vit.* 128.—H. Bn. *Adansonia*, xii. 230, 246.—Kurz, *For. Fl. Brit. Burm.* ii. 58.—Griseb. *Fl. Brit. W.-Ind.* 347.—Hiern, *Fl. Trop. Afr.* iii. 191.—Hook. *Bot. Mag.* t. 3351.—Walp. *Rep.* ii. 485; vi. 48; *Ann.* ii. 759.

cells are biovulate, with or without a false partition between the two ovules of the same cell.

Gynochthodes, of the Indian Archipelago, has also the same gynæcium, without the false partition between the two ovules in those named *Tetralopha*. The flowers are in axillary cymes, or in sessile or shortly pedunculate glomerules; they are polygamous or hermaphrodite and closely resembling those of the *Imantina* section of the genus *Morinda*.

Cruckshanksia (fig. 277, 278) is included in this series because its ovarian organization is fundamentally that of *Morinda*, and because

Cruckshanksia flava.

Fig. 277. Flower (♀).

Fig. 278. Long. sect. of base of flower.

in each of its two cells there are two ascending ovules, with micropyle exterior and inferior. But the habit is very different, and the placenta, which bears one ovule on the right and another on the left, has between them an inconsiderable prominence dividing the cell into two halves only at the internal angle. The corolla is valvate like that of *Morinda;* the stamens enclosed are inserted at the throat, and the fruit is dry, tardily dehiscent, as said, in four valves. In nearly all the species, the gamosepalous calyx assumes a large development, and becomes foliaceous and membranous, reticulate-veined, except in *C. glacialis*, of which a genus *Oreopolus* has been made. They are herbaceous or subshrubby plants from the cold and etmperate regions of Chili; the flowers are in terminal cymes

resembling umbels or capitules, and surrounded by an involucre of simple or lobed bracts, sometimes much developed.

There are cells of *Cruckshanksia* which are triovulate. In this case the placenta becomes somewhat more salient, especially towards the summit, where it abandons the partition and bears three ovules. In

Carphalea angulata.

Fig. 279. Flower ($\frac{6}{1}$).

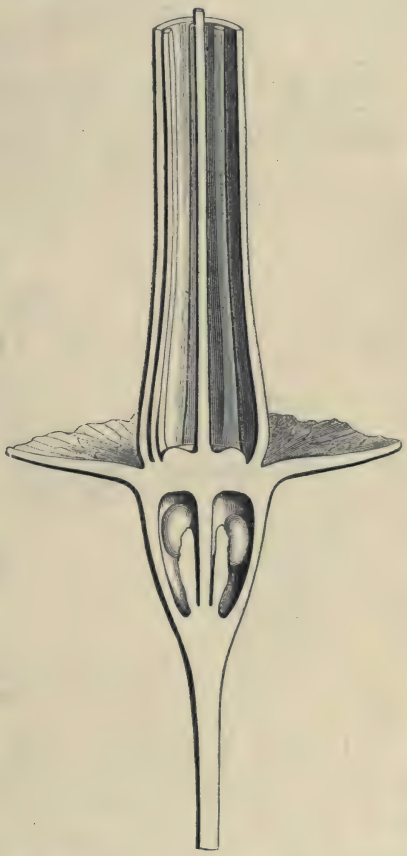

Fig. 280. Long. sect. of base of flower ($\frac{15}{1}$).

Carphalea, from tropical eastern Africa, continental and insular, the placenta is more elongate, becomes more slender, free or nearly so, and also bears near the summit two or three ovules, rarely more. The corolla is also that of *Cruckshanksia*, and the calyx becomes foliaceous and coloured, accrescent, sometimes equally so as to remain regular, sometimes unequally (fig. 279, 280), so that its lobes are more developed on one side than on the other. *Carphalea*

consists of shrubby or subshrubby plants with opposite leaves and flowers united in compound terminal, not unfrequently corymbiform, cymes.

Jackia, a large tree of Malaya and the Indian Archipelago, has the flowers of *Carphalea*, with a slender and biovulate placenta in each cell, and an irregular, finally coriaceous and finely reticulate-veined accrescent calyx. These flowers are numerous, in large uniparous compound cymes, with foliaceous bracts analogous to the calycinal lobes.

Phyllomelia coronata (fig. 281), a Cuban shrub, also has the accrescent calyx of the preceding genera, membranous and regular.

Phyllomelia coronata.

Fig. 281. Long. sect. of flower (§).

In each of its two ovarian cells is an erect placenta of *Jackia* and *Carphalea*, but with a single ovule in each instead of two or three. What chiefly renders this genus abnormal in the series is, that the lobes of the corolla, when the flower, as is often the case, is hexamerous, are arranged in two verticils: three exterior and three interior alternate. In the pentamerous flowers, there are two exterior lobes.

Retiniphyllum, the place of which is most doubtful, forms here also an abnormal subseries and has nothing in common with most of the preceding genera, except that there are in each cell two collateral ascending ovules with micropyle inferior and exterior. They are curved, amphitropous and borne on an ascending funicle. The ovary

is 5-celled, surmounted by a hollow style. It becomes a fleshy fruit with five putamens enclosing each an albuminous seed. The calyx is gamophyllous, 5-dentate, and the corolla has five contorted lobes; at its throat are inserted five stamens with dorsifixed apiculate and versatile anthers. They are shrubs of eastern tropical America, having flowers in terminal spikes with connate bracteoles forming a calicule under the flower.

VII. CHIOCOCCA SERIES.

In the flowers of *Chiococca*[1] (fig. 282–285), which are generally hermaphrodite and pentamerous,[2] the inferior ovary is surmounted by

Chiococca racemosa.

Fig. 283. Flower.

Fig. 282. Bud (5/1).

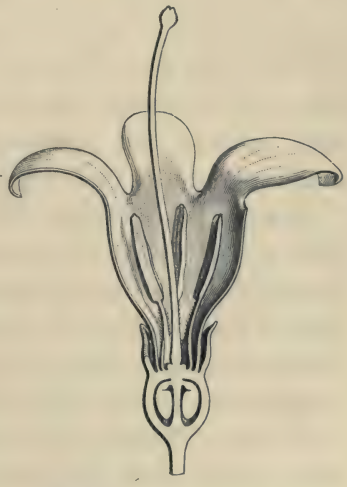

Fig. 285. Long. sect. of flower.

a short dentate calyx and a funnel- or bell-shaped corolla, the limb of which is divided into five lobes[3] marginally imbricate in the bud. The stamens, epigynous, are scarcely united with the base of the

[1] P. Br. *Jam.* 174.—L. *Gen.* n. 231.—Gærtn. *Fr.* i. 125, t. 26.—Lamk. *Ill.* t. 160.—Rich. *Rub.* 106.—DC. *Prodr.* iv. 482 (§ i.).—Spach, *Suit. à Buffon*, viii. 437.—Endl. *Gen.* n. 3167.—B. H. *Gen.* ii. 106, n. 211.—H. Bn. *Bull. Soc. Linn. Par.* 182.—? *Margaris* DC. *Prodr.* iv. 483.—*Desclæa* Sess. et Moç. (ex B. H.).—*Siphonandra* Turcz. *Bull. Mosc.* (1848) i. 581.

[2] There are some with four and six parts.

[3] The margins, very thin, slightly overlap. They have been thought valvate, perhaps because the angles of the corolla have been confounded with these margins.

corolla, and their monadelphous filaments form a short tube around the style above which they become free, more or less hairy, and support a dorsifixed bilocular extrorse anther,[1] dehiscing by two longitudinal clefts. The ovary is surmounted by a thick disk and a style whose stigmatiferous extremity is slightly dilated and almost entire. The ovarian cells are two in number, rarely more, each enclosing a descending ovule inserted near the top of the internal angle, with dorsal raphe, and micropyle interior and superior.[2] The fruit is a small drupe with a flesh of little thickness or coriaceous, monospermous putamens, and the seed encloses under its coats an abundant fleshy or coriaceous albumen, and an axile embryo with oval or elliptical cotyledons and superior radicle.

Chiococca racemosa.

Fig. 284. Diagram.

Chiococca is from tropical America; the woody and slender stems are often climbing. The leaves are opposite entire small glabrous with pointed and persistent stipules. The flowers[3] are in axillary clusters of cymes, often unilateral, without bracts.[4]

Among the genera, all American, ranged beside the preceding, several ought not to be separated from it except as sections; for notwithstanding some considerable external differences, the fundamental organization of the flower remains though it has been often misunderstood. Thus, *Asemnantha pubescens*, from Yucatan, has the tetramerous flowers of *Chiococca;* but the four lobes of the corolla are nearly valvate, though they preserve a very slight trace of imbrication, and the tomentose plant bears axillary few-flowered cymes or even solitary flowers. *Scolosanthus*, small spinous or unarmed shrubs of the Antilles, has also small tetramerous axillary flowers, solitary or in small cymes, with narrow elongate calycinal divisions, a small elongate corolla with lobes very distinctly imbricate, and, like the preceding, stamens monadelphous at the base, with extrorse anthers. *Ceratopyxis verbenacea*, a resinous shrub of Cuba,

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[1] Or with submarginal clefts.

[2] Its short funicle is dilated to an obturator more or less developed.

[3] White or yellowish. The fruit is said to be ordinarily white.

[4] There are half a dozen species. Hook. *Ex. Fl.* t. 93.—R. et Pav. *Fl. Per. et Chil.* t. 219.—Griseb. *Fl. Brit. W.-Ind.* 336.—Walp. *Rep.* ii. 483; vi. 45; *Ann.* i. 374; v. 112.

has the pentamerous flowers of *Chiococca*, united in elongate clusters of cymes, with imbricate corolla and long subulate rigid sepals, persistent under the fruit, which is dry, much compressed perpendicular to the partition and finally separates into two inwardly dehiscing cocci. *Machaonia* comprises tropical unarmed or spinous trees or shrubs of both Americas whose flowers in clusters of cymes, terminal and corymbiform, have five equal or unequal sepals, a much imbricated corolla, free stamens, inserted at the throat of the corolla, and introrse anthers. The fruit, compressed perpendicular to the partition, separates into two dry suberose indehiscent cocci. *Placocarpa mexicana* is a small microphyllous shrub whose flowers, solitary or united in few-flowered cymes, are those of *Machaonia*, usually tetramerous, with elongate spathulate persistent sepals. *Erithalis*, plants of the Antilles and neighbouring shores of the two Americas, has larger flowers, generally numerous, united in terminal compound and corymbiform cymes, with a short calyx and an elongate corolla of 5–10 lobes nearly valvate or imbricate at the margin, especially above ; as many stamens with filaments inserted near the lower part of the corolla and extrorse anthers. The ovary, 4–10-celled with one descending ovule in each cell, is surmounted by a compressed style, papillose at the margin, and the drupaceous fruit contains 4–10 putamens the albuminous seeds of which have an axile embryo with inferior cotyledons. *Chione*, very analogous to the preceding in its external characters, is distinguished from it by the short round very imbricate lobes of the corolla, subauriculate at the base, the dorsifixed and introrse anthers and the bilocular ovary surmounted by a style divided above into two truncate branches enlarged at the summit. The drupaceous fruit has a two-celled putamen, and the macropod embryo has inferior cotyledons. They are also shrubs of the Antilles with compound terminal cymes.

Guettarda (fig. 286–289), which has been referred to a separate tribe (*Guettardeæ*), very closely approaches *Erithalis* in its fundamental organization. It is a very polymorphous genus. In the old world species, the oldest known and to which the name *Cadamba* has been given, the flowers often have from five to ten parts and are hermaphrodite or polygamo-diœcious. They have an inferior ovary which may be hollowed into as many cells as there are lobes in the corolla ; and the latter, more or less elongate, thick, hairy, straight or curved, is imbricate in the bud. The enclosed stamens are

inserted at a variable height in the tube of the corolla and alternate with the lobes. In each cell is a descending anatropous ovule, with the micropyle directed outwards and inwards, and the fruit has a thick putamen, hollowed in cells each containing one descending seed. The embryo is fleshy, surrounded by an albumen of little thickness, often reduced to a simple membrane. There are *Guettardas* with only five, four or three lobes to the corolla, as many stamens and as many ovarian cells or less, two, for example, with as many stigmatiferous divisions at the top of the style. The calyx is caducous, or persistent, as in *Antirrhœa*, *Robea*, &c. In other species the number of cells may become very considerable, and then the cavities of the putamen may be disposed either without apparent order, or in rayed series, double or simple, with great regularity. This is the case especially in *Timonius*, species from tropical Asia and Oceania and Madagascar, in which the divisions of the corolla very slightly overlap or are completely valvate, and in the American *Guettardas* named *Chomelia* and *Malanea*. This genus comprises, therefore, a great number of plants from the tropical regions of the two worlds. The leaves are opposite or verticillate, and the flowers are in compound, often racemiform and very frequently also uniparous cymes (fig. 289). They may be solitary, and this is not unfrequently the case in the female specimens of species whose male inflorescences are many-flowered. *Hodgkinsonia*

Guettarda speciosa.

Fig. 286. Bud (½).

Fig. 287. Long. sect. of flower.

Guettarda (*Timonius*) *Pervilleana.*

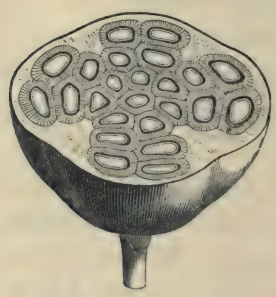

Fig. 288. Trans. sect. of fruit (½).

ovatiflora, a small Australian tree, has polygamo-dicœcious flowers which approach very nearly to those of the reduced types of *Guettarda*. The corolla is valvate or slightly imbricate. In the male flower, the sterile ovary is surmounted by a simple subulate and papillose style. The ovary becomes an elongate drupe with a 2–4-celled putamen. We can consider this plant as forming only a section of the genus *Guettarda;* its inflorescences resemble umbels sometimes superposed.

Guettarda elliptica.

Fig. 289. Inflorescence.

Canthium (fig. 290–293), to which we annex as a section the old genus *Vangueria*, has given name to a separate tribe (*Vangerieæ*).

Canthium (*Vangueria*) *edule.*

Fig. 290. Flower (4).

Fig. 291. Diagram.

Fig. 292. Long. sect. of flower.

The flower is often 4, 5-merous, with an inferior ovary of two cells, in each of which is a descending ovule with dorsal raphe, an umbilic more or less thick and micropyle interior and superior. The calyx is entire or with four or five teeth or lobes, and is early detached at the base. The corolla, valvate, 4, 5-lobed, bears, at a variable height of its tube, deflexed hairs, often arranged in a very clearly defined ring. The stamens have an introrse anther with connective often thick, apiculate and coloured. The style is generally surmounted by a stigmatiferous cap in form like an extinguisher or mushroom.

In the true *Canthium* the fruit is usually didymous or heart-shaped, drupaceous, with one or two putamens. More rarely there are three and as many cells in the ovary. In *Vangueria* there are from three to six, very often five, superposed to the divisions of the corolla. The number of cells or putamens in the fruit varies in like manner. We can make it only a section of *Canthium*. So likewise with *Fadogia*, *Cuviera*, which have usually as many cells in the ovary as there are divisions in the calyx of the corolla; *Ancylanthus*, which may have the limb of the corolla incurved; *Pyrostria*, whose polygamo-diœcious flowers have 2–10 cells in the ovary; *Scyphochlamys*, which is *Pyrostria* with the involucral bracts of the inflorescence connate in a sort of horn. In the last the stigmatiferous portion of the style loses more or less the mitre or hood shape and becomes nearly claviform. So also in *Cyclophyllum*, oceanic plants which often have rather large flowers and two cells in the ovary like the true *Canthium*. There are types of this genus, such as *Peponidium* and *Clusiophyllea*, which have ten to twelve cells in the ovary and fruit. The flowers in this genus are often unisexual or polygamous. They are woody plants, not unfrequently climbing, rarely herbaceous, which have opposite or verticillate leaves, and axillary flowers, in cymes or glomerules, sometimes solitary. In some species the ovules are incompletely anatropous and ascending. They are found in all the tropical regions of the old world. The albumen, usually continuous, occasionally becomes ruminate. Very near *Canthium*, *Craterispermum*, a shrub of tropical Africa, has flowers in axillary cymes, with a cup-shaped accrescent calyx, a corolla hairy in the throat, a fusiform stigma, entire or with two branches, and a 1, 2-celled fruit with chartaceous endocarp.

Canthium (*Cuviera*) *acutiflorum*.

Fig. 293. Long. sect. of flower.

Prismatomeris is scarcely distinct from *Canthium*. It has the valvate corolla, the fleshy fruit, the descending ovule. But the stylary branches are linear-lanceolate and the radicle of the embryo is inferior, which leads to the ovule being incompletely anatropous. They are shrubs of south-eastern Asia and the Indian Archipelago.

In *Damnacanthus*, spinous shrubs of China, Japan and Bengal, the flowers are the same in construction with ovarian cells and stylary divisions 2–4. The ovule also is descending; and, as in *Prismatomeris* and for the same reason, the embryonic radicle is inferior. The flowers are solitary or geminate. They have the same organization as in *Mitchella* (fig. 294), generally referred to another series and inhabit, one Japan, the other North America. They are perennial climbing herbs and perhaps only a section of *Damnacanthus*. The stipules are membranous, not spinous, in the true *Mitchella*, and the axillary or terminal geminate flowers have their ovaries united in a common receptacle, instead of being independent like those of *Damnacanthus*; a character observed in various honeysuckles.[1]

Mitchella repens.

Fig. 294. Long. sect. of two-flowered inflorescence (4).

Cremaspora (fig. 295), with *Alberta*, has been ranged in a separate tribe (*Albertæ*) of *Rubiaceæ*, with solitary descending ovule, the corolla of which is contorted instead of being valvate. Otherwise, their resemblance to *Canthium* is very close. The stamens are inserted in the throat of the corolla, and the fleshy fruit encloses one or two descending and albuminous seeds. In the true *Cremaspora*, the flowers are generally pentamerous; the style is not divided, and the horny perisperm is continuous. In those named *Polysphæria*, the flower is in four or five parts; the style is ordinarily divided into

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[1] In *Dichilanthe*, of Ceylon and Borneo, there are, not two but, a greater number of flowers forming a false capitule. The corolla is curved and subbilobed. *Salzmannia* and *Phialanthus*, American shrubs, have also many-flowered cymes; but they are axillary. The corolla is valvate or slightly imbricate. The anthers of the former are basifixed, of the latter, dorsifixed. All have a descending ovule with dorsal raphe.

two branches, and the albumen is more or less deeply ruminate. They are all shrubs of tropical eastern Africa, continental and insular, with flowers in axillary cymes or glomerules often accompanied with pairs of connate bracts forming a sort of calicule.

Beside *Cremaspora* are ranged *Aulacocalyx* and *Belonophora*, shrubs of tropical western Africa, which have axillary cymes, and a two-celled ovary with ovules of *Canthium*. The former has pointed sepals and exserted stamens, whilst in the latter the calycinal divisions are shorter, obtuse, and the stamens shorter. With us these form only two sections of the same genus. Their fruit is unknown. *Galiniera*, an Abyssinian shrub, which is in the same case and whose inflorescences are also axillary cymes, has pentamerous flowers, with a contorted corolla and two ovarian cells, surmounted by a style which may divide into two branches. Each of its cells may contain, it is said, two descending ovules; but most frequently there is in reality only one as in the preceding genera. The style has longitudinal prominences in the form of narrow wings, more marked in the plant of Zanzibar called, for that reason, *Rhabdostigma*; and *Octotropis*, of Travancore, may be considered as a *Rhabdostigma* with tetramerous flowers, eight stylary ridges and two incomplete ovarian cells.

Cremaspora microcarpa.

Fig. 295. Flower, one ovarian cell open.

With the same gynæcium and a general floral organization quite analogous, *Alberta*, trees of Madagascar and southern Africa, have sepals of which two, three or four are accrescent above the fruit in membranous spathulate and veined wings. The style is long fusiform, and the inflorescences are terminal. The same is the case with *Nematostylis*, a shrub of Madagascar, of which only one of the five sepals becomes foliaceous, the corolla is contorted and the long exserted style divides above into two lobes; so that this plant connects the preceding types with those of *Ixora* the ovule of which is more or less distinctly descending. *Lamprothamnus*, a shrub of

Zanzibar, unites this series also with that of the *Coffeeæ*, for it has the flower of a Coffee, sometimes with five, sometimes with six or seven parts. But its ovule is descending with a neighbouring thickening of the umbilic, like that of *Canthium*, and its inflorescences are those of *Nematostylis*.

Knoxia, of which a separate tribe (*Knoxieæ*) has been made, has two cells with ovule of *Canthium*, a valvate corolla, a dicoccous fruit and terminal cymes. The columella is wanting in those named *Pentanisia* and the style is undivided. They are herbs of the old world, especially abundant in tropical Africa. The calyx is of 4, 5 unequal divisions, short dentiform or, in *Pentanisia*, in part elongate and even foliaceous. The stamens are sometimes dimorphous, longer usually and exserted in the male flowers, whilst the anthers may be sessile in the female flowers.

The genus *Synisoon* is exceptional in this series inasmuch as each of its ovarian cells encloses two parallel descending ovules instead of one; both are attached to a thickened part of the funicle. The cells are five in number. The only species known, from British Guyana, is a woody plant with opposite leaves and inflorescences in terminal cymes. The tubular calyx divides lengthwise on one side; the corolla is contorted, and its five stamens have a dorsifixed and apiculate anther. The style is terminated by a stigmatiferous bowl with five slightly marked lobes.

VIII. GENIPA SERIES.

Tournefort made known in 1700,[1] according to Plumier,[2] the first *Genipa* studied by European botanists, *G. americana* (fig. 296). It is a fine tree with opposite leaves accompanied by intrapetiolar stipules, the hermaphrodite flowers of which have an inferior ovary of two complete or incomplete cells with numerous ovules, surmounted by an epigynous cupuliform disk and a thick, lance-pointed style traversed by two longitudinal furrows and bearing on its surface a trace of the impression of the more exterior organs. Its calyx is

[1] *Inst.* 658, t. 436, 437.

[2] *Cat.* 20 (1703).—L. *Gen.* (ed. 1) n. 930.—J. *Gen.* 201; *Mém. Mus.* vi. 391.—Lamk. *Dict.* ii. 629; Suppl. ii. 707; *Ill.* t. 158, fig. 2.—Rich. *Rub.* 164, t. 12, n. 2.—DC. *Prodr.* iv. 378.—Spach, *Suit. à Buffon*, viii. 408.—Endl. *Gen.* n. 3306.—B. H. *Gen.* ii. 90, n. 168.

gamosepalous, with five or six obtuse crenels, and its funnel-shaped corolla is divided into five or six contorted lobes in the bud. With these alternate an equal number of elongate, dorsifixed, nearly sessile anthers inserted near the base of the corolla tube, with two introrse cells, surmounted by pointed prolongation of the connective. The fruit is a corticate berry, with numerous albuminous seeds plunged in soft pulp. The embryo is flat with wide foliaceous cotyledons and cylindrical radicle. The flowers of this tree are in few-flowered cymes or even solitary; and the same characters are met with in half a dozen other *Genipas* from tropical America, the knowledge of which is more recent and often also incomplete.

Genipa americana.

Fig. 296. Inflorescence.

The flowers of the Asiatic and African *Genipas*, named by HOUSTON[1] *Randia*, are generally hermaphrodite and more rarely unisexual. The concave receptacle encloses the inferior ovary and supports an entire or divided calyx and a superior corolla. The latter is hypocrateriform, funnel-shaped or campanulate, with five divisions (more rarely 4 or 6–10), contorted in prefloration. The stamens, equal in number, inserted at the throat of the corolla, have a filament generally short or nil, and a dorsifixed introrse anther dehiscing by two longitudinal clefts. The ovary mostly has two (more rarely a greater number of) cells, with numerous anatropous ovules inserted on placentas of various form. There are equally numerous variations in the stigmatiferous lobes of the style, the base of which is surrounded by an epigynous glandular disk often undivided, fusiform. The fruit is a berry surmounted by the persistent calyx or its scar; the surface is

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[1] *Linn. Hort. Cliff.* 485.—L. *Gen.* n. 211.—J. *Gen.* 199; *Mém. Mus.* vi. 392.—DC. *Prodr.* iv. 384.—ENDL. *Gen.* n. 3304.—B. H. *Gen.* ii. 88, n. 166.—BAKER, *Fl. Maurit.* 141.—HOOK. *Fl. Ind.* iii. 109.—*Oxyceros* LOUR. *Fl. Cochinch.* (ed. 1790) 150.—*Stylocoryne* CAV. *Icon.* iv. 45, t. 368 (not W. and ARN.).—*Cupia* DC. *Prodr.* iv. 394 (part).—*Ceriscus* GÆRTN. f. *Fruct.* iii. 140, t. 28.—*Gynopachys* BL. *Flora* (1825), 134; *Bijdr.* 983.—ENDL. *Gen.* n. 3310.—*Lachnosiphonium* HOCHST. *Flora* (1842), 236.—*Canthiopsis* SEEM. *Fl. Vit.* 166, t. 46.—*Canthopsis* MIQ. *Fl. Ind.-Bat.* ii. 256.—B. H. *Gen.* ii. 113, n. 234.—H. BN. *Bull. Soc. Linn. Par.* 206.

often coriaceous, and its pulp covers numerous seeds, variable in direction, with horny albumen,[1] surrounding an embryo generally axile, with oval or orbicular foliaceous cotyledons. They are trees, sometimes spinous, of nearly all the tropical regions of the globe.

Genipa (*Gardenia*) *florida.*

Fig. 297. Flower ($\frac{3}{2}$).

Fig. 298. Long. sect. of flower.

The leaves are opposite, very rarely verticillate, accompanied by intrapetiolar stipules most frequently connate in a sheath. The flowers,[2] varying much in appearance, are rarely terminal, and more generally axillary, solitary or in cymes, with longer or shorter pedicels or even none.

In the *Genipas* named *Griffithia*,[3] often spinous or climbing, the flowers, small in figure, are in corymbiform cymes, and the tube of the hypocrateriform corolla is generally longer than the lobes. They are plants of tropical Asia. Some unarmed *Griffithias* of western tropical Africa, having the throat of the corolla hairy and four ovarian cells, have received the name of *Morelia*.[4] *Mitriostigma*[5] is also

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[1] Often confounded with the very thin coat of the seed, which, apparently, is produced only by a differentiation of the superficial layer.

[2] White, yellow, pink or spotted, often large, handsome, sometimes odorous.

[3] W. and Arn. *Prodr.* 399 (not R. Br. nor Ker).—Endl. *Gen.* n. 3302.—*Pseudixora* Miq. *Fl. Ind.-Bat.* ii. 209.

[4] A. Rich. *Rub.* 152.—DC. *Prodr.* iv. 617.—Endl. *Gen.* n. 3324.—Hiern, *Fl. Tr. Afr.* iii. 112.

[5] Hochst. *Flora* (1842), 235.—B. H. *Gen.* ii. 90, n. 169.—Hiern, *Fl. Trop. Afr.* iii. 111.

African; it has pointed or acuminate stipules, free or little connate, and a coriaceous fruit, turbinate at the base, often nearly fusiform. The seminal envelope is slightly fibrous. It is so also in the true American *Genipas*, whose corolla is hairy at the throat and the

Genipa (*Gardenia*) *Thunbergia*.

Fig. 299. Fruit.

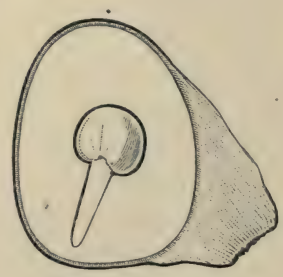

Fig. 301. Long. sect. of seed.

Fig. 300. Long. sect. of fruit.

intrapetiolar stipules generally fall early. The ovarian cells are two in number, complete or incomplete in the same species; and this latter alternative is the more remarkable as the presence of these incomplete cells, corresponding to that of the parietal placentas, is the only character distinguishing from the true *Randias*, *Gardenia*[1] (fig. 297-301), beautiful plants from the tropical regions of the old world, and especially *Rothmannia*,[2] whose large and showy flowers[3] are axillary or terminal, most frequently solitary or geminate. The species

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[1] Ell. *L. Gen.* n. 296.—DC. *Prodr.* iv. 3~9. —Rich. *Rub.* 159, t. 12, n. 1.—Spach, *Suit. à Buffon*, viii. 409.—Endl. *Gen.* n. 3305.—B. H. *Gen.* ii. 89, 1228, n. 167.—Baker, *Fl. Maurit.* 142.—Hook. *Fl. Ind.* iii. 115.—*Piringa* J. *Mém. Mus.* vi. 399.—*Thunbergia* Mont. *Act. Holm.* (1773) t. 11.—*Sahlbergia* Neck. *Elem.* n. 418.—*Bergkais* Sonner. *Voy.* t. 17, 18.—*Chaquepiria* Gmel. *Syst.* 651 (ex Endl.). — ? *Thiolliera* Montrous. *Mém. Acad. Lyon.* x. 217.

[2] Thunb. *Act. Holm.* (1776) 65, c. icon.

[3] The ovary, in some exceptional species from tropical Africa, may have only one parietal placenta (Hiern, *Journ. Bot.* [1878] 97, t. 195).

of *Gardenia* such as *G. Annæ*,[1] of the Seychelles, the corolla of which is infundibuliform-campanulate, connect with these *Amaralia*,[2] of which the calyx and corolla are contorted and the lobes of the latter, five or six in number, are rounded, with close and abundant hair at the throat. *Basanacantha*[3] is an American *Randia*, with complete or incomplete ovarian cells, whose flowers are unisexual; and *Casasia*[4] is an Antillean *Gardenia* with two incomplete ovarian cells, whose coriaceous leaves have very numerous and parallel oblique secondary nervures, as in a great many *Clusiaceæ*. *Byrsophyllum*,[5] a native of India and Madagascar, has also unisexual 4–6-merous flowers, but with a narrow elongate corolla united in terminal few-flowered and corymbiform cymes. The narrow and elongate form of the corolla tube is found still more marked in *Gardenia tubiflora* Rich., &c., of which the genus *Tocoyena*[6] has been made and which inhabits Brazil and Guyana. The flowers are in corymbiform cymes, terminal and subsessile. In *Randia longistyla*,[7] a species from western tropical Africa, constituting the genus *Macrosphyra*,[8] the flowers similarly grouped, in contracted cymes, at the ends of the branches, have also a narrow and very elongate corolla; but the style itself assumes a very elongate form bearing its enlarged didymous furrowed stigmatiferous extremity high above the contorted limb of the corolla.

Unable to regard the following types as congeneric with *Randia* and *Gardenia*, we shall retain them only as sections of the genus *Gènipa*:

Anomanthodia,[9] a *Randia* of the Indian Archipelago, whose small 5, 6-merous flowers are often in extra-axillary cymes, with a tubular disk, the lobes of the corolla rather longer than the tube and exserted stamens whose anther cells are more or less deeply partitioned and divided into cellules.

Brachytome,[10] an Indian *Randia* whose cymes are lateral or

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[1] P. Wright, *Trans. Ir. Acad.* xxiv. 575, t. 28.—Hiern, *Fl. Trop. Afr.* iii. 103, n. 8.

[2] Welw. ex B. H. *Gen.* ii. 90, n. 170.—Hiern, *loc. cit.* 112. The ovarian cells are complete or sometimes incomplete.

[3] Hook. f. *Gen.* ii. 82, n. 151.

[4] A. Rich. *Fl. Cub.* t. 49.—B. H. *Gen.* ii. 84, n. 156.

[5] Hook. f. *Gen.* ii. 83, 1228, n. 152.—Hook. *Fl. Ind.* iii. 107.

[6] Aubl. *Guian.* i. 131, t. 50.—J. *Gen.* 201; *Mém. Mus.* vi. 390.—Rich. *Rub.* 162.—Endl. *Gen.* n. 3309.—B. H. *Gen.* ii. 83, n. 154.

[7] DC. *Prodr.* iv. 388, n. 32.—*Oxyanthus villosus* Don, *Gen. Syst.* iii. 494.—*Gardenia longistyla* Hook. *Bot. Mag.* t. 4322.

[8] Hook. f. *Gen.* ii. 86, n. 161.

[9] Hook. f. *Gen.* ii. 87, n. 165.—Hook. *Fl. Ind.* iii. 108.

[10] Hook. f. *Icon.* t. 1088; *Gen.* ii. 87, n. 164.—Hook. *Fl. Ind.* iii. 108.

oppositifolious, the calyx wide cupular slightly dentate, and the lobes of the corolla short funnel-shaped and rounded.

Pelagodendron,[1] a *Randia* of the Viti isles whose gamosepalous calyx breaks irregularly into two or three unequal lobes.

Sphinctanthus,[2] an American *Genipa* with terminal flowers, solitary or few, the corolla of which is contracted towards the summit of its rather short tube.

Leptactinia,[3] a *Gardenia* of tropical Africa whose flowers are united in terminal corymbiform cymes, with the calycinal folioles developed and wide stipules. *Dictyandra*,[4] from the same country, differs essentially only in its large flowers with sessile and locellate anthers, and is to the true *Leptactinia* what *Anomanthodia* is to *Randia* proper.[5]

In New Caledonia are *Genipas* allied to *Gardenia*, whose ovary becomes elongate and so narrow that the seeds are in a single longitudinal series; they are separated from each other by threads, and the entire fruit in its form resembles some siliquas; hence the name *Siliquorandia*[6] given to this section. In other plants of the same group, the seeds, not numerous, are elongated at one extremity to a short wing, like that we have described in *Olostyla*, and the flowers, very small, are grouped in glomerules in the axil of the leaves. They have been named *Paragenipa*.[7] *Randiella*[8] also has very small flowers springing from the wood of the branches. The style is dilated above to a stigmatiferous sphere. They are from New Caledonia. Other peculiarities, more important still, characterize *Xylanthorandia*,[9] whose large flowers with funnel-shaped corolla, recalling those of *Amaralia* and *Gardenia Annæ*, grow from the wood of the branches.

Thus defined, this very extensive genus[10] comprises about

[1] Seem. *Fl. Vit.* 124.—B. H. *Gen.* ii. 92, n. 174.

[2] Benth. *Hook. Journ. Bot.* iii. 212.—B. H. *Gen.* ii. 84, n. 155.—*Conosiphon* Pœpp. *Endl. Gen.* Suppl. ii. 54; *Nov. Gen. et Spec.* iii. 27, t. 233.

[3] Hook. f. *Icon.* t. 1092 (*Leptactina*); *Gen.* ii. 85, n. 160.—Hiern, *Fl. Trop. Afr.* iii. 87.

[4] Welw. ex B. H. *Gen.* ii. 85, n. 159.

[5] We believe we may connect with the *Leptactinia* section of *Genipa*, as an abnormal type, *Heinsia*, from the same country, which has been placed in another group, and which has the flowers of *Randia* in terminal cymes, but the fruit of which finally becomes more or less dry and unilocular. (DC. *Prodr.* iv. 390.—Endl. *Gen.* 3300.—Hook. *Bot. Mag.* t. 4207.—B. H. *Gen.* ii. n. 137.)

[6] H. Bn. *Adansonia*, xii. 210.

[7] H. Bn. *Bull. Soc. Linn. Par.* 207.

[8] H. Bn. *Adansonia*, xii. 295.

[9] The type of which is *Randia Beccariana* H. Bn. (*Adansonia*, xii. 246).

[10] Sect. 22: 1. *Eugenipa;* 2. *Gardenia* (Ell.); 3. *Rothmannia* (Thunb.); 4. *Mitriostigma* (Hochst.); 5. *Griffithia* (W. and Arn.); 6. *Randia* (Houst.); 7. *Anomanthodia* (H. f.); 8. *Basanacantha* (H. f.); 9. *Sphinctanthus* (Bth.); 10. *Casasia* (Rich.); 11. *Dictyandra* (Welw.); 12. *Leptactinia* (H. f.); 13 ? *Heinsia* (DC.); 14. *Tocoyena* (Aubl.); 15. *Macrosphyra* (H. f.); 16. *Byrsophyllum* (H. f.); 17. *Brachytome* (H. f.); 18. *Pelagodendron* (Seem.); 19. *Amaralia* (Welw.); 20. *Xylanthorandia* (H. Bn.); 21. *Randiella* (H. Bn.); 22. *Genipella* (H. Bn.).

two hundred species [1] belonging to all warm regions of the globe.

Amaioua is extremely near *Genipa*. The flowers are dicœcious, generally hexamerous. The calyx is gamosepalous, entire or with six teeth, sometimes long and narrow, and the corolla is contorted, coriaceous, with pointed straight or curved bud. The ovary has two complete or incomplete multiovulate cells, and the fusiform style is divided or not into two branches. The fruit is a many-seeded berry. They are trees or shrubs from tropical America, with terminal or subterminal flowers in corymbiform cymes. The female flowers are less numerous or even solitary in the inflorescences. *Duroia* is *Amaioua* whose flowers have a developed calyx and the throat of the corolla destitute of hairs or nearly so. The number of cells, complete or incomplete, in the ovary varies from two to four. In *Alibertia*, which can only form a section of the genus *Amaioua*, the number of parts in the flower varies from four to eight and the ovarian cells, generally incomplete, vary from two to eight. *Cordiera* is also of the same genus and from the same country; but the contorted corolla with pointed lobes, presents in the bud an enlargement corresponding to the limb, and another, as slightly marked, corresponding to the base of the tube.[2]

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[1] Plum. *Icon.* (ed. Burm.) t. 136.—R. et Pav. *Fl. Per.* t. 220, fig. *a*.—Roxb. *Pl. Corom.* t. 135–137 (*Randia*).—Moric. *Pl. Nouv. Amér.* t. 56 (*Tocoyena*).—Pœpp. et Endl. *Nov. Gen. et Spec.* t. 229 (*Tocoyena*).—Karst. *Fl. Colomb.* ii. t. 167 (*Randia*).—Griseb. *Fl. Brit. W.-Ind.* 316, 318 (*Randia*), 317 (*Posoqueria*); *Cat. Pl. Cub.* 122.—Harv. and Sond. *Fl. Cap.* iii. 4 (*Gardenia*), 7 (*Randia*).—Bak. *Fl. Maurit.* 141 (*Randia*), 142 (*Gardenia*).—Balf. f. *Bot. Rodrig.* 45, t. 22.—Hiern, *Fl. Trop. Afr.* iii. 80 (*Heinsia*), 85 (*Dictyandra*), 87 (*Leptactinia*), 93 (*Randia*), 99 (*Gardenia*), 105 (*Macrosphyra*), 111 (*Mitriostigma*), 112 (*Amaralia, Morellia*).—Miq. *Fl. Ind.-Bat.* ii. 207 (*Griffithia*), 209 (*Pseudixora*), 219 (*Gynopachys*), 226 (*Randia*), 228 (*Gardenia*), 256 (*Canthopsis*); Suppl. 218, 251 (*Griffithia, Pseudixora*), 219, 542 (*Randia*), 543 (*Gardenia*).—F. Muell. *Fragm.* ix. 180 (*Randia*).—Benth. *Fl. Austral.* iii. 407 (*Gardenia*), 411 (*Randia*); *Fl. Hongk.* 153 (*Gardenia*), 154 (*Randia*).—Bedd. *Ic. Pl. Or.* i. t. 20 (*Gardenia*), 37, 38 (*Griffithia*), 96 (*Byrsophyllum*), 237 (*Randia*).—Thw. *Enum. Pl. Zeyl.* 154 (*Coffea*), 158 (*Griffithia*), 159 (*Randia, Gardenia*).—Kurz, *For. Fl. Brit. Burm.* ii. 39 (*Gardenia*), 44 (*Randia*), 51 (*Brachytome*).—Wawr. *Maxim. Reis. Bot.* t. 72 (*Tocoyena*).—Karst. *Fl. Colomb.* ii. t. 149 (*Conosiphon*).—Seem. *Fl. Vit.* t. 46 (*Canthiopsis*).—Kotsch. *Pl. Tinn.* t. 16 (*Gardenia*).—H. Bn. *Adansonia*, xii. 244–246 (*Randia*).—*Bot. Reg.* (1846) t. 63 (*Gardenia*).—*Bot. Mag.* t. 690, 1842, 1904, 3349 (*Gardenia*), 3409 (*Randia*), 4044, 4185, 4307 (*Gardenia*), 4322 (*Randia*), 4343 (*Gardenia*), 4791 (*Randia*), 4987, 5410 (*Gardenia*).—Walp. *Rep.* ii. 517 (*Griffithia*), 518 (*Randia*), 519 (*Gardenia*), 520 (*Sphinctanthus*), 521 (*Tocoyena*), 943 (*Randia*), 944 (*Gardenia*); vi. 73 (*Randia, Gardenia*), 75 (*Conosiphon*), 702 (*Gardenia*); *Ann.* i. 380 (*Gardenia*); ii. 794 (*Griffithia, Randia*), 796 (*Gardenia*), 798 (*Gynopachys*); v. 103 (*Gardenia*), 134 (*Randia*).

[2] *Rhyssocarpus*, a native of tropical America unknown to us, has solitary female flowers succeeded by a fruit said to be fleshy, "subglobular, torulous-costate." Perhaps it should

Chapeliera, a glabrous shrub of Madagascar, has also nearly the flowers of a *Genipa*, in small supra-axillary cymes, with a calyx of five rigid acuminate divisions, a contorted tubular corolla, five dorsifixed anthers and a two-celled ovary surmounted by a fusiform style with two stigmatiferous branches. On the placenta, in the form of a horse-shoe, are inserted the ovules generally few in number. The fruit is a berry surmounted by a calyx, and the albuminous seeds are remarkable for a resisting envelope which easily divides into thick and sinuous fibrous threads. The American genus *Posoqueria* closely approaches the *Genipas* with elongate corollas. Its own has a very long tube; but the imbricate limb is oblique at the summit of the tube and becomes gibbous, therefore, in the bud. The anthers are exserted and the stigmatiferous extremity of the style is bifid. The flowers are in terminal corymbiform cymes. The extended form of the corolla becomes more manifest still in most species of *Oxyanthus*, woody plants from tropical Africa, the corymbiform cymes of which are axillary; the tube of the corolla is very slender and elongate, and the limb contorted. The calyx is dentate, and the two multiovulate cells of the ovary are complete or incomplete as in *Genipa* from which *Oxyanthus* differs little and has the fleshy fruit and seeds with coriaceous and fibrous external coat.

Though ordinarily placed in another group, *Kotchubea* (fig. 302) appears to closely approach the preceding types. Unfortunately its female flowers are unknown and the fruit which succeeds them is known only as a drupe with some monospermous putamens surmounted by a persistent calyx. In the male flower, the receptacle, obconical and flat, is surmounted by an entire tubular calyx and a long gamopetalous corolla, and the coriaceous tube by a limb with eight pointed and contorted lobes. The stamens are represented by as many elongate subsessile introrse bilocular and enclosed anthers. In the centre of the flower is a style with two oblong divisions, and its base is surrounded by a depressed circular disk. *Kotchubea insignis* is a fine glabrous tree of Guyana with opposite oblong leaves, connate intrapetiolar stipules, and male flowers united in compound cymes of three-flowered cymules.

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be referred as a section to the genus *Amaioua*. J. Hooker says of it: "it presents a form allied indeed to *Alibertia* but very distinct." It has perhaps affinities also with *Kotchubea* (fig. 302), of which the male flowers only are known, but the fruit (which we have not seen) is indicated as globular, fleshy, and becoming ribbed by the process of desiccation.

Phitopis has flowers very analogous to those of the preceding genera, especially *Genipa;* they are surrounded by bracts covered with silky hairs, like the calyx. The latter is valvate and divided into irregular lobes. The corolla, contorted and its throat covered with hairs, bears from four to six stamens with bearded filaments. The two ovarian cells contain each an inverted triangular multiovulate placenta, and the two terminal lobes of the style are short and thick. They are hairy trees of eastern Peru, with flowers in terminal trichotomous cymes. The Brazilian *Billiottia* has dicœcious flowers like those of *Amaioua* to which it is closely allied. The corolla, hairy at the throat, is of four or five parts and the ovary is said to be 3–5-celled. The female flowers are terminal and solitary; the males, in corymbiform cymes. They are pubescent shrubs with intrapetiolar stipules united in a sheath which finally divides.[1] *Stachyarrhena*, from the same regions, also has solitary female flowers and the ovary is divided into a variable number of cells; but the

Kotchubea insignis.

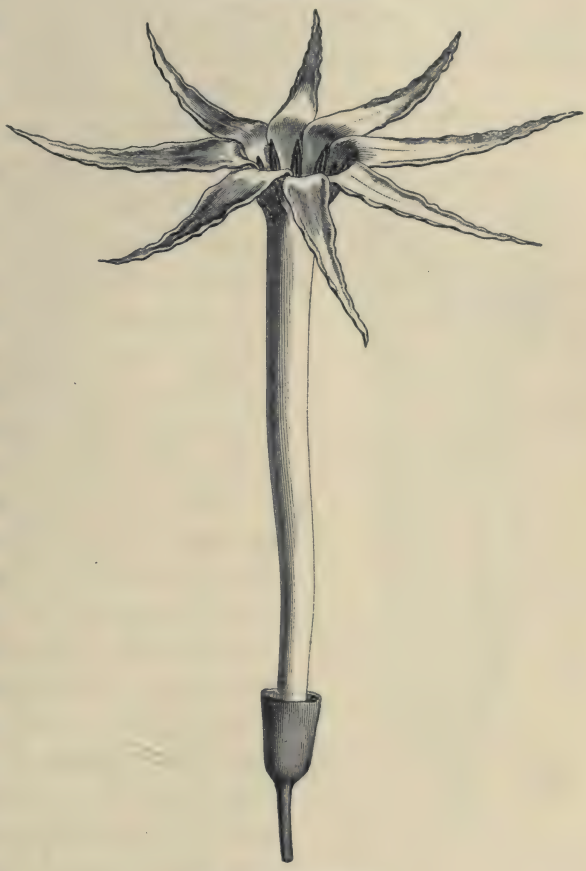

Fig. 302. Male flower.

[1] We know not whether to preserve distinct or to refer to the genera *Billiottia* or *Amaioua* (?), *Schachtia*, a Columbian tree, with enlarged internodes, the dicœcious flowers of which are constructed nearly as those of the types just mentioned; the males solitary and the females grouped in cymes on short axillary branches.

male flowers are grouped in small glomerules borne on a common axis and forming a spike of cymes, that is a mixed inflorescence. The flowers are in other respects constructed like those of a *Genipa* or *Amaioua*.

In the two genera *Pouchetia* and *Petunga*, the flowers are constructed like those of *Randia*, in the former 5-merous, in the latter 4, 5-merous. The corolla is small funnel-shaped contorted; the anthers, nearly sessile, are inserted at the throat, and the ovary, with two multiovulate cells, becomes a few-seeded berry. In *Pouchetia*, from western tropical Africa, the ovarian cells are in part incomplete, the disk is annular, the style branches slender, traversed by a furrow, the seeds angular and the flowers in simple or compound axillary clusters. In *Petunga*, growing in India and the Indian Archipelago, the ovarian cells are complete, the epigynous disk entire or bilobed, the style branches covered with hairs, the seeds imbricate squamiform and the flowers in simple or rarely somewhat compound spikes. In *Fernelia*, shrubs of the Mascarene isles, the organization of the flowers is very similar; but they are unisexual, ordinarily tetramerous, surrounded by a small 4-dentate involucre formed of connate bracts. The ovary has two cells, generally incomplete, and is surmounted by two thick stylary branches. The flowers are small, axillary, solitary or in cymes and very few, almost sessile. In *Morindopsis*, inhabiting south-eastern tropical Asia, the flowers are dicœcious, axillary and long-pedunculate. They have a calyx with four imbricate-decurved teeth, a corolla with four contorted lobes, four enclosed stamens and an ovary of two cells each containing several flattened descending and imbricate ovules. The fruit is elongate, indehiscent, but with a thin and very fragile pericarp. The female flowers are often solitary at the end of the peduncle; but below them are two pairs of bracts and these may become fertile; this may occur especially in the male inflorescence and gives to the latter the

Canephora axillaris.

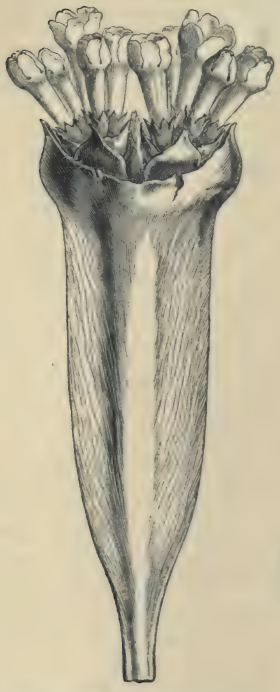

Fig. 303. Inflorescence (½).

appearance of a capitule. In *Scyphostachys*, native of Ceylon, the floral peduncle, axillary or supra-axillary, terminates in a small spike of tetramerous flowers, with contorted corolla and pauciovulate ovarian cells. But the bracts of the inflorescence, membranous oblique and imbricate, take a large development and closely envelop the flowers before blooming. The fruit is a few-seeded berry. *Cancphora* (fig. 303), from Madagascar, ordinarily placed in another group, has its small floral cymes united at the end of a common peduncle in the form of flattened branches. The small funnel-shaped 4–6-merous corolla is contorted and the two ovarian cells enclose a few ovules.

The genus *Hypobathrum* is polymorphous; the exterior parts are, on a small scale, nearly those of *Genipa*, and often, like those of *Cremaspora*, bear on their pedicels one or several pairs of connate bracteoles forming a sort of involucel. The corolla is constantly contorted and the inflorescences are small axillary cymes. But what varies most in the flower is the number of ovules contained in each of the ovarian cells. In the same plant, in fact, may be observed either two ranks of several ovules occupying the margins of the placenta, or two ovules only, one to the right, the other on the left, very incompletely anatropous, the hilum is ordinarily very near the upper extremity, and the micropyle directed downwards and outwards. Generally also, the less numerous the ovules are in a given cell, the greater is the development of the placenta forming for each a small cellule, similar to that of *Ixora*, in which they are encased. In those of the section *Kraussiella*, there is only a single ovule; the same in *Nescidia*. *Empogona* has one or two; *Zygoon*, one, two or three, without dilatation of the placenta around them. *Tricalysia* (fig. 304) generally has from two to ten, and in these the collarettes of the pedicels are generally most developed. In *Diplospora*, which is Asiatic, there are from two to four ovules or more; and in *Hyptianthera*, likewise included in this genus, there are ten to twelve in a cell. In all these plants, the fruit is small and fleshy, one- or few-seeded.

Hypobathrum (*Tricalysia*) *angolense*.

Fig. 304. Flower with ovarian cell open (4).

They are shrubs from the tropical regions of Asia, Oceania and especially tropical Africa.

Burchellia (fig. 305), also from south Africa, has flowers closely resembling in their organization those of some *Gardenias*, with narrow-pointed divisions in the persistent calyx; a contorted corolla the throat of which is covered with hairs; anthers enclosed, sessile or nearly so, basifixed, surmounted by a prolongation of the connective, and two multiovulate ovarian cells, with a fleshy fruit. But the style, short and enlarged in the middle, terminates in a truncate denticulate stigmatiferous extremity, and the flowers terminal and sessile, accompanied with bracts like stipules, are grouped in a contracted cyme which has been erroneously taken for an umbel.

Burchellia bubalina.

Fig. 305. Group of young fruit.

In *Flagenium*, formerly referred to the *Lonicereæ*, the flowers are nearly those of a *Burchellia*, with narrow and elongate persistent calycinal divisions, and a contorted corolla. The fruit is also said to be fleshy; but the contracted and biparous cymes occupy the axil of the leaves, and in each of the two cells the ellipsoid placentas bear only a few ovules, the upper ascending and the lower descending. Ordinarily one of them assumes a much greater development than the others. It is a shrub of Madagascar with opposite and lanceolate leaves

Scyphiphora, a glabrous shrubby plant of tropical Asia and Oceania, the habit and foliage of which are nearly those of a *Rhizophorea*, has pentamerous and oftener tetramerous flowers, with a contorted corolla, an epigynous lobed disk and two or three ovules in each cell. In the latter case, the two upper are often ascending and the lower descending. The fruit is a drupe of two putamens, with false transverse partitions dividing them into monospermous cellules, and the flowers are in pedunculate axillary cymes.

In *Bertiera*, of doubtful place, the flowers have an ovary with two multiovulate cells, a calyx with short teeth or none and a corolla with five contorted lobes. Sometimes one of the latter becomes quite covered and another covering by its two margins. The introrse anthers are surmounted by a pointed apicule of the connective. But the ovules are borne on an enlarged placenta, furnished with a rather long foot (like that of some *Oldenlandieæ*), and the flowers are grouped in cymes and these often in pendent clusters. They are trees or shrubs, with opposite leaves and connate stipules, from tropical Africa and America.[1]

Hamelia patens.

Fig. 306. Bud (⅞).

Fig. 307. Long. sect. of flower.

Hamelia (fig. 306, 307), of which has been made a tribe (*Hamelieæ*) of this family, approach the preceding types in their fleshy fruit and the general organization of their flower; but the prefloration of the corolla is different. The lobes of the very short limb are imbricate so that one is covered by its two margins. The elongate tube of the latter is angular, and the ovary, surmounted by a fusiform style, has as many cells as there are lobes in the corolla and are superposed to them, or only two to four cells. The fruit is a polyspermous berry. *Hamelia* comprises glabrous or pubescent shrubs of tropical and subtropical America. The leaves are opposite or oftener verticillate, and the flowers are in terminal corymbs of uniparous cymes.

Bothriospora corymbosa, a shrub of northern Brazil, has also an imbricate corolla, scarcely irregular. The four or five divisions of its calyx are imbricate and membranous. The ovary has four or five multiovulate cells and is surmounted by a style the summit of which

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[1] Here perhaps should be placed the genus *Zuccarinia*, unknown to us and which we shall leave provisionally among the types of uncertain place (see p. 364).

is divided into the same number of stigmatiferous branches. The fruit is said to be fleshy. It is so or more or less dry in *Hoffmannia* which has an imbricate corolla with four or five lobes, sometimes very thin at the margin, and generally two multiovulate cells in the ovary with the same number of stylary branches. They are glabrous or hairy shrubby or herbaceous plants of tropical America, especially of Mexico, with axillary cymes, pedunculate or sessile and contracted as in those named *Xerococcus*.

Catesbæa forms here a small group in which the flowers, very small, have an angular and 4-lobed, tubular-campanulate corolla, with four lobes imbricate at the margin, although described as valvate. The four stamens are inserted near the base of the corolla, and the ovary, surmounted by a style bidentate at the summit, contains in each of its two complete or incomplete cells, an indefinite number of ovules, generally descending. The fruit is a coriaceous berry. *Catesbæa* inhabits the Antilles; they are glabrous, spinous shrubs, with small leaves, almost none, even in that named *Phyllacantha*, whose spinescent axillary branches are triangular and much compressed vertically as in some *Rhamnaceæ* of the genus *Colletia*.

Gonzalagunia, woody or herbaceous plants of tropical America, has flowers with a funnel-shaped or hypocrateriform corolla, a narrow tube and a limb with four or five imbricate lobes. The fruit is a drupe or berry, and the flowers, often dimorphous, are grouped on the common axis, simple or branched, of a long and slender terminal spike. *Isertia*, also tropical American, has flowers in construction nearly like those of the preceding but larger. The corolla, thick and coriaceous, has four, five or six lobes, imbricate or valvate, the hollows often projecting outwards. The ovarian cells vary from two to six in number, as in *Hamelia*, and the fruit is fleshy. The exterior surface of the corolla is often rugose or even tubercled, as in *Cassapa*, which is only an *Isertia* with a valvate corolla and an ovary generally bilocular.

Mussaenda (fig. 308, 309) has also given name to a tribe (*Mussaendeæ*). It differs from the preceding genera chiefly in the prefloration of the corolla, which is valvate, more or less reduplicate, but the lobes may be contorted at the extremity. The fruit is generally fleshy and indehiscent, sometimes dry, and then indehiscent or loculicidal; this proves that these fruit-characters have here no

absolute value. It is the same with the insertion of the stamens; for sometimes the filaments spring from a variable height of the corolla, and sometimes they are inserted quite at the bottom of the tube and remain attached to it to a considerable extent by the hairs

Mussaenda Landia.

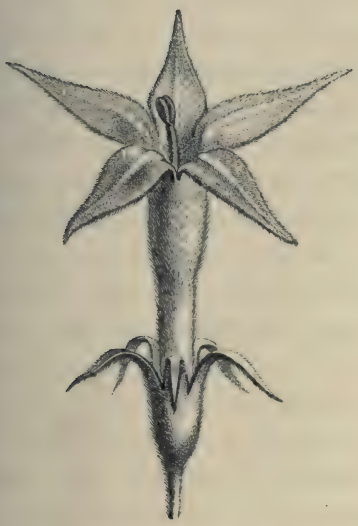

Fig. 308. Flower ($\frac{2}{1}$).

Fig. 309. Long. sect. of flower.

with which it is covered. And even in *Acranthera*, with us Asiatic or Oceanic *Mussaendas*, herbaceous or subshrubby, the filaments quit the tube of the corolla from the base and become attached round the style. The flowers of *Mussaenda* are in terminal clusters of cymes, stipitate or contracted. They are natives of all tropical regions of the old world. *Polysolenia* is an Indian *Mussaenda* whose inflorescence is contracted to a terminal false capitule and the elongate tube of the corolla is enlarged a little below the expansion of the limb. *Adenosacme* has, on a smaller scale, the flowers of *Mussaenda*, with a corolla of 4–6 lobes, valvate-reduplicate. The 2–6-celled ovary becomes a fleshy or coriaceous fruit, indehiscent or loculicidal, and the compound cymes are axillary and terminal. They are feeble shrubs, natives of India and the Indian Archipelago.

Sabicea (fig. 310) is the type of a small group in which the inflorescences are in compound axillary often contracted cymes. The flowers have calycinal lobes, often unequal, varying in number from three

to six, a valvate corolla, and an ovary the cells of which are often the same in number as the divisions of the corolla, to which they are superposed, more rarely less. The style is divided above into the same number of branches, and the fruit is fleshy. They are generally climbing plants, natives of the tropical regions of both worlds. The ovarian cells are often incomplete, and so also are those (five in number) of *Patima*, from Guyana, the calyx of which is truncate, and which, with us, forms a section of the genus *Sabicea*. *Stipularia*, hairy shrubs of tropical Africa, has a 2–5-celled ovary; it is only a *Sabicea* whose contracted axillary cymes have bracts developed to a large cup-shaped involucre. *Schizostigma* is a near neighbour of *Stipularia* without the large involucral bracts. But the five divisions of the calyx, equal or unequal, have the form of leaves, narrowed to a petiole at the base and persistent. The corolla is valvate; the ovarian cells are five in number (more rarely six or seven), stylary branches the same, and the fruit is indehiscent, more or less fleshy. The flowers are in axillary glomerules, many-flowered in *Pentaloncha* and *Temnopteryx* which represent the African sections of *Schizostigma*.

Sabicea (*Patima*) *guianensis*.

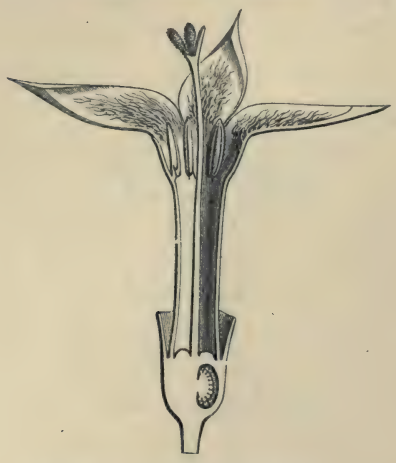

Fig. 310. Long. sect. of flower.

Urophyllum has small axillary flowers, in cymes or glomerules, an ovary of two to five pluriovulate cells surmounted by a small calyx with 4–8 short teeth, and a small subrotate corolla with 4–8 valvate lobes. The fruit is a small berry. The flowers are often unisexual. The ovarian cells are sometimes incomplete, particularly in a species with few-flowered inflorescence and dicarpellar gynæcium, from western tropical Africa, distinguished under the name of *Pauridiantha*. *Aulacodiscus*, inhabiting Malacca, has nearly all the characters of *Urophyllum*. The flower may have as many as fifteen parts, and the corolla is formed of short almost independent petals. The flowers are diclinous and the sterile stamens of the female flower are incurved upon the margin of a well developed and lobed epigynous

disk, in the form of a thick cup at the bottom of which is inserted a style dilated above to a lobed funnel.

Lecananthus, climbing shrubs of the Indian Archipelago, has an inferior ovary with two multiovulate cells and a membranous and many-seeded fruit. The valvate corolla is five-lobed and bears five alternate stamens. But the horn-like gamosepalous calyx is divided into two irregular lips. The flowers are in false capitules composed of very close and contracted glomerules, resembling those of *Cephælis*, and are surrounded by connate bracts forming an involucre. By this character *Lecananthus* connects the secondary group of the *Sabiceæ* to the following, the *Schradereæ*.

In *Schradera*, the terminal inflorescences are also in false capitules of compound cymes, around which the involucral bracts are borne on a cuplike dilatation of the axis, more or less pronounced. The flowers, 5–10-merous, have a truncate calyx, a corolla with thick and valvate lobes and an ovary with two multiovulate cells succeeded by a fleshy fruit. They are glabrous, coriaceous often pseudo-epiphytal shrubs, with opposite leaves and intrapetiolar stipules, inhabiting tropical America. *Lucinæa*, from the Indian Archipelago, closely approaches *Schradera*. The spherical inflorescences, formed of compound glomerules, resemble externally those of *Morinda*. But the ovaries are free and the two cells multiovulate. In *Leucocodon*, a climbing and "epiphytal" shrub of Ceylon, the terminal inflorescence is the same but surrounded by a large whitish campanulate involucre. The pentamerous and valvate corolla is surrounded by a gamophyllous calyx which opens irregularly at anthesis. The characters of this plant are, therefore, those of a *Cephælis* except that the two ovarian cells are multiovulate. *Didymochlamys Whitei*, a small Columbian herb, has the terminal inflorescence of the preceding genera, surrounded by an involucre of coloured bracts, two of which are very large, and the two ovarian cells are multiovulate. But the five lobes of the corolla become thin and strongly folded over the margin; it is moreover quite an exceptional plant in this family in that its leaves are alternate, distichous, obliquely lanceolate, with dimorphous stipules (?) of quite a peculiar form.

Hippotis is exclusively tropical American and the flowers are all axillary. In those named *Sommera* they are numerous and in compound pedunculate cymes, contracted or not. In the true *Hippotis* and in *Tammsia*, with us only a section of it, the cymes are generally

few-flowered or reduced even to 1-3 flowers. Divided into more or less unequal foliaceous lobes in *Sommera*, the calyx is spathelike and opens unequally in *Hippotis* proper, whilst in *Tammsia* it represents a large campanulate and veined envelope which divides into unequal lobes. In all these plants the corolla is valvate, 4–6-lobed; the ovary has two multiovulate cells, often incomplete, and the fleshy fruit, surmounted by the persistent calyx, encloses numerous small angular seeds with fleshy albumen.

Pentagonia is also American and has flowers in axillary corymbiform cymes, sessile or shortly pedunculate and pedicellate. The corolla, tubular or funnel-shaped, is divided into five or six thick and valvate lobes. The stamens are inserted near the base of the tube and often have unequal filaments, recurved at the summit. The ovary has two multiovulate cells and the fruit is fleshy. The flowers are, in fact, nearly those of certain *Genipas* of the same regions, but with a valvate corolla not contorted. They are shrubs, one volubile, with large stipules and broad leaves which may be pinnatifid and not unlike those of *Artocarpus incisa*.

Ordinarily referred to quite a different group (*Hamelieæ*), *Gouldia* is distinguished by its valvate corolla, the lobes of which are thick, triangular on transverse section, in number four or five, and much resembling that of some *Uragogas*. The fruit is fleshy and opens sometimes at the summit. The ovarian cells are multiovulate; in other respects the floral characters are those of *Uragoga*. The leaves are opposite, and the flowers are either axillary or oftener in simple few-flowered or branched and many-flowered cymes. They are shrubs of the Sandwich isles.

Myrioneuron, shrubs of Asia and tropical Oceania, approaching several of the preceding genera by their inflorescences in compound, capituliform and terminal or axillary glomerules, has nearly the flowers of *Mussaenda*, pentamerous, the calycinal divisions elongated to a point, valvate corolla and two pluriovulate ovarian cells. The fruit is fleshy or membranous and sometimes opens slowly or incompletely. In this respect these plants approach the *Oldenlandieæ*. *Payera conspicua*, of Madagascar, appears to us near the preceding. The two cells of its inferior ovary enclose each a multiovulate placenta nearly sessile. The style is long and slender with two branches. The corolla is five-lobed, valvate, surrounded by five large foliaceous and persistent calycinal lobes. The fruit has a thin

pericarp, probably dry and coriaceous at maturity. It is a glabrous plant with large opposite leaves accompanied by two large foliaceous interpetiolar stipules. The inflorescence, situate at the end of a small axillary branch which bears either leaves or only their stipules, is a compound capituliform cyme with short pedicels, the final divisions of which become uniparous. It is surrounded by three unequal pairs of bracts forming an involucre, so that the inflorescence is nearly that of a *Cephælis*.[1]

IX. OLDENLANDIA SERIES.

This genus, to which we shall restore many others that have been successively separated from it, was founded in 1703 by Plumier. In the true *Oldenlandia*[2] of this author (fig. 311–314), the flowers are of five or oftener four parts and nearly always hermaphrodite. The concave obconical or globular receptacle lodges in its cavity a bilocular ovary, surmounted by a style with two short stigmatiferous branches and a little developed epigynous disk. In each ovarian cell is a placenta globular or nearly so, supported by a foot inserted at a variable point of the interlocular partition from the base to the

[1] Three genera of doubtful affinity, imperfectly known to us, especially the first two, have been ranged in this group, viz. *Gonianera*, *Lasiostoma* and *Praravinia*. *Gonianera* is from Sumatra. Its flowers would be pentamerous, its corolla valvate; the ovary bilocular and multiovulate, surmounted by a style with long claviform stigmatiferous branches. Its polyspermous fruit is a berry. The flowers are axillary, accompanied with bracts. *Lasiostoma*, a glabrous shrub of New Guinea and New Ireland, with the opposite leaves of *Loranthus*, has axillary capituliform inflorescences. The flowers are said to be tetramerous, with entire calyx, valvate corolla, and the fruit fleshy and polyspermous. *Praravinia*, a shrub of Borneo, with opposite leaves, has polygamo-monœcious, 4–6-merous flowers, in axillary cymes mistaken for capitules, remarkable for their wide involucrant bracts. The sepals are similar to the bracts and accrescent. The corolla is valvate and the gynæcium formed of a 6–10-celled ovary, surmounted by a large disk and a 6–10-branched style. The ovules are very numerous on placentas represented as branched. The fruit is said to be fleshy.

[2] Plum. *Nov. Pl. Amer. Gen.* (1703) 42, t. 36.—L. *Gen.* n. 154.—J. *Gen.* 198.—Lamk. *Ill.* t. 61.—Gærtn. *Fruct.* i. t. 30.—DC. *Prodr.* iv. 424.—B. H. *Gen.* ii. 58, 1228, n. 83.—Baker, *Fl. Maurit.* 138.—Hook. *Fl. Ind.* iii. 64.—*Listeria* Neck. *Elem.* n. 456 (ex DC.).—*Gerontogea* Ch. et Schlchtl, *Linnæa*, iv. 154.—*Gonotheca* Bl. ex DC. *Prodr.* iv. 429.—Endl. *Gen.* n. 3239.—*Kohautia* Ch. et Schlchtl, *loc. cit.* 156.—*Karamyschewia* Fisch. et Mey. *Bull. Mosc.* (1838) 266.—*Theyodis* A. Rich. *Fl. Abyss.* i. 364.

middle. It is charged with ovules indefinite in number, rarely few.[1] At the margin of the receptacle are inserted a short calyx with three, four or five teeth, short or rarely foliaceous, not unfrequently accompanied with a variable number of alternate (stipulary ?) denticules, and a valvate rotate, funnel-shaped or hypocrateriform

Oldenlandia Deppeana.

Fig. 311. Floriferous branch.

Fig. 312. Long. sect. of flower (4/1).

Fig. 313. Seed (10/1).

Fig. 314. Long. sect. of seed.

corolla, bearing an equal number of alternate stamens, with bilocular, introrse, enclosed or exserted anthers. The fruit is a capsule, often membranous, variable in form, loculicidal above or in its entire height, more rarely indehiscent, with seeds very variable, often indefinite, in number, which, round or polyhedral,[2] smooth or granular, enclose in a fleshy albumen an embryo usually straight, cylindrical or claviform. They are herbaceous or shrubby plants, with opposite, rarely verticillate leaves, and stipules simple or divided, sometimes into hairs. The flowers[3] are in more or less ramified cymes, often biparous, terminal or axillary; rarely solitary or few. In a small

[1] Exceptionally they are, it is said, solitary. They have but one coat, generally very incomplete, sometimes even almost nil.

[2] Sometimes prolonged to a wing.

[3] Small, white, yellowish, reddish or violet.

feeble and creeping herbaceous species of tropical Asia and Oceania, generically named *Dentella*,[1] the flowers are ordinarily solitary in the dichotomy of the branches or in the axil of the leaves, sessile or pedicellate, and the hispid fruit is indehiscent.

Notwithstanding differences, sometimes considerable, of habit and foliage in *Hedyotis*,[2] in this respect resembling *Spermacoce*, we can, following the example of many authors, make them only a section of *Oldenlandia*, in which the stems are herbaceous or often shrubby, or volubile, with rather broad leaves,[3] stipules of very variable form, corollas short or more or less tubular, and a fruit indehiscent or dehiscent, frequently coriaceous or crustaceous. Certain American species of *Hedyotis* have been distinguished generically under the name of *Mallostoma*;[4] they are erect or creeping shrubs with coriaceous imbricate or ericoid leaves, coriaceous capsules, usually septicidal. Others, natives of warm Africa, named *Pentodon*,[5] have 4, 5-merous flowers, a membranous loculicidal capsule, an herbaceous stem and soft leaves with deflexed fructiferous pedicels. In *Hekistocarpa*,[6] also an *Oldenlandia* of western tropical Africa, herbaceous, annual and slender, the pentamerous flowers are sessile on the axis of a cyme which becomes uniparous by abortion; the corolla is slightly reduplicate; the style has two subspathulate and recurved branches, and the capsule, septicidal, is elongate and compressed. *Oldenlandia tuberosa*, from the Antilles, has also become the type of a separate genus under the name of *Lucya*;[7] it is a humble herb with root more or less enlarged, corolla rotate, and fruit loculicidal in the upper part, projecting more or less beyond the orifice of the receptacular cup.

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[1] Forst. *Char. Gen.* 25, t. 13 (1776).—J. *Gen.* (1789) 200; *Mém. Mus.* vi. 385.—Lamk. *Ill.* t. 118.—Rich. *Rub.* 190.—DC. *Prodr.* iv. 418.—Endl. *Gen.* n. 3238.—B. H. *Gen.* ii. 54, n. 74.—Hook. *Fl. Ind.* iii. 42.—*Lippaya* Endl. *Atakt.* 13, t. 13.—*Bertuchia* Dennst. *Hort. Malab.* ix. 39 (ex Endl.).

[2] L. *Gen.* n. 118.—Rich. *Rub.* 186.—DC. *Prodr.* iv. 419.—Endl. *Gen.* n. 3240.—B. H. *Gen.* ii. 56, 1228, n. 81.—A. Gray, *Proc. Amer. Acad.* iv. 313.—Ch. et Schlchtl, *Linnæa*, iv. 153.—*Leptopetalum* Hook. et Arn. *Beech. Voy. Bot.* 295, t. 61.—Hook. *Fl. Ind.* iii. 49.—*Scleromitrion* Wight and Arn. *Prodr.* 412.—*Agathisanthemum* Kl. *Pet. Moss. Bot.* 294.—*Peltospermum* Benth. *Niger*, 400.—*Dictyospora* Reinw. ex Korth. *Ned. Kruidk. Arch.* ii. 157.—*Metabolos* Bl. *Bijdr.* 990.—*Pentodon* Hochst. *Flora* (1844), 552.

[3] In form and nervation, variable according to district, they sometimes even recall those of the Monocotyledons.

[4] Karst. *Fl. Colomb.* ii. 9, t. 105.—B. H. *Gen.* ii. 60, n. 87.—*Ereicotis* DC. *Prodr.* iv. 431 (sect. *Anotidis*).—*Pseudorhachicallis* Karst. *loc. cit.* 10.

[5] Hochst. *Flora* (1844), 552.—B. H. *Gen.* ii. 58, n. 82.—*Pentotis* Torr. et Gr. *Fl. N.-Amer.* ii. 42 (sect. *Hedyotidis*).

[6] Hook. f. *Icon.* t. 1151; *Gen.* ii 62, n. 92.

[7] DC. *Prodr.* iv. 434.—Endl. *Gen.* 550, l.—B. H. *Gen.* ii. 61, n. 90.—*Dunalia* Spreng. *Syst. Veg.* i. 366.

The same characteristics occur in *Houstonia*,[1] a small herb of warm and temperate America, with flowers often dimorphous, axillary or in biparous cymes, mostly tetramerous, and the loculicidal capsule encloses seeds more or less peltate as in some other sections of this genus. The ovary and septicidal fruit are also partly superior in *Leptoscela*,[2] a Brazilian herb having the characters of vegetation and inflorescence of *Hekistocarpa*, with the habit of some *Ruellias*, and whose seeds are longer than wide.

The corolla not unfrequently becomes tubular, claviform or pointed in the bud in certain *Oldenlandias* of both worlds. The character is especially marked in most of those of which have been made the genera *Anotis*,[3] *Teinosolen*[4] and *Kadua*.[5] The latter, from the Sandwich islands, the type of which is *Hedyotis elata*, has a tetramerous flower with long tubular corolla and a coriaceous or slightly fleshy capsule, loculicidal at the summit, with angular or winged seeds, attached at the surface or in depressions of thickened placentas. The flowers are in terminal axillary or lateral cymes. *Anotis* is American, Asiatic or rarely Australian; it has a tubular corolla, if claviform in the bud, 4-lobed; an ovary generally bilocular,[6] loculicidal and bivalved; seeds compressed or slightly winged. They are herbaceous or subshrubby plants, with axillary and terminal, often corymbiform or capituliform cymes. *Teinosolen*[7] also has an elongate corolla with five valvate lobes. The capsular fruit is crustaceous and septicidal. They are glabrous ramose Bolivian shrubs with small opposite or subfasciculate coriaceous leaves with indistinct nervures, and few or solitary terminal flowers.

Thus defined,[8] the great genus *Oldenlandia* comprises about two

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[1] L. *Gen.* n. 124.—J. *Gen.* 197.—Gærtn. *Fruct.* i. t. 49.—DC. *Prodr.* iv. 622.—B. H. *Gen.* ii. 60, n. 86.—*Macrohoustonia* A. Gray, *Proc. Amer. Acad.* iv. 26.

[2] Hook. f. *Icon.* t. 1149.—B. H. *Gen.* ii. 59, n. 84.

[3] DC. *Prodr.* iv. 431 (part).—B. H. *Gen.* ii. 59, n. 85.—Hook. *Fl. Ind* iii. 71.

[4] Hook. f. *Gen.* ii. 61, n. 88.

[5] Cham. et Schlchtl, *Linnæa*, iv. 157 (part).—DC. *Prodr.* iv. 430.—Rich. *Rub.* 188.—A. Gray, *Proc. Amer. Acad.* iv. 317.—B. H. *Gen.* ii. 61, n. 91.—*Wiegmannia* Meyen, ex Walp. *Pl. Meyen.* 354, t. 9.

[6] It may be, here and there, 3, 4-celled, and there is even a *Hedyotis quadrilocularis*.

[7] Hook. f. *Gen.* ii. 61, n. 88.

[8] Sect. 20: 1. *Euoldenlandia;* 2. *Peltospermum* (Bth.); 3. *Dentella* (Forst.); 4. *Agathisanthemum* (Kl.); 5. *Hedyotis* (L.); 6. *Scleromitrion* (W. and Arn.); 7. *Dictyospora* (Reinw.); 8. *Pentodon* (Hochst.); 9. *Kohautia* (Ch. et Schlt.); 10. *Gonotheca* (Bl.); 11. *Leptopetalum* (H. and Arn.); 12. *Karamyschewia* (Fisch. et Mey.); 13. *Hekistocarpa* (H. f.); 14. *Leptoscela* (H. f.); 15. *Houstonia* (L.); 16. *Mallostoma* (Karst.); 17. *Lucya* (DC.); 18. *Kadua* (Cham. et Schlchtl); 19. *Anotis* (DC.); 20. *Teinosolen* (H. f.).

hundred and fifty species[1] and is represented in all warm and temperate regions of the globe except Europe.

By the intervention of *Kadua* and *Teinosolen*, *Bouvardia* (fig. 315–317), generally attributed to quite a different group, is closely allied to *Oldenlandia*. The flower is almost always tetramerous; the lobes of the calyx dentiform or elongate with tongues often interposed; the corolla tubular, straight or curved, with valvate lobes, glabrous or hairy within; anthers dorsifixed, enclosed or exserted; the two stigmatiferous branches of the style are papillose on their entire surface or at the margin and interior face. The ovary has two cells each enclosing an erect or ascending placenta attached to the partition by a narrow point and bearing an indefinite number of ascending ovules. The fruit is a loculicidal or septicidal capsule, that is finally divided into four pannels; and the seeds, peltate, compressed or bordered with a cellular wing, enclose a small albuminous embryo. They are herbs or shrubs of tropical or subtropical America, with opposite or verticillate leaves, connate stipules, and terminal corymbiform cymes.

Bouvardia Jacquini.

Fig. 315. Flower (½).

Fig. 317. Placenta.

Fig. 316. Long. sect. of base of flower.

[1] Wight, *Icon.* t. 822, 1030.—W. and Arn. *Prodr.* 409 (*Anotis*), 417.—Bart. *Fl. Amer. Sept.* t. 34.—Griseb. *Fl. Brit. W.-Ind.* 330, 331 (*Lucya*); *Cat. Pl. Cub.* 130.—A. Gray, *Man.* (ed. 2) 172.—Clos. *C. Gay Fl. Chil.* iii. 205 (*Hedyotis*).—Harv. and Sond. *Fl. Cap.* iii. 8 (*Hedyotis*).—Baker, *Fl. Maurit.* 138.—Hiern, *Fl. Trop. Afr.* iii. 51, 65 (*Hekistocarpa*).—Balf. f. *Bot. Rodrig.* 45.—Kl. *Pet. Moss. Bot.* 296.—Wawr. *Flora* (1875), 260, 272 (*Kadua*).—Miq. *Fl. Ind.-Bat.* ii. 177 (*Hedyotis*), 185 (*Scleromitrion*), 187, 195 (*Dictyospora*), 196 (*Dentella*); Suppl. 216, 539 (*Hedyotis*, *Scleromitrion*), 217.—Benth. *Fl. Austral.* iii. 403 (*Hedyotis*), 406 (*Dentella*); *Fl. Hongk.* 147 (*Hedyotis*), 150.—Bedd. *Icon. Pl. Ind. Or.* i. t. 1–8, 26–28, 29–36, 191 (*Hedyotis*).—Thw. *Enum. Pl. Zeyl.* 140 (*Hedyotis*), 144 (*Dentella*).—Boiss. *Fl. Or.* iii. 10.—Walp. *Rep.* ii. 491 (*Gonotheca*, *Hedyotis*), 502 (*Karamyschewia*, *Leptopetalum*); vi. 54 (*Hedyotis*), 56 (*Karamyschewia*), 57 (*Leptopetalum*), 700 (*Metabolus*); *Ann.* i. 376 (*Hedyotis*); ii. 768 (*Hedyotis*), 772 (*Theyodis*), 775 (*Peltospermum*); v. 116 (*Hedyotis*).

Coccocypselum and *Synaptantha* are connected with *Oldenlandia* by other sections. The former, whose flower is tetramerous, having a valvate corolla and two ovarian cells, with a globular placenta supported by a foot attached to the base or near the middle of the partition, is an American *Hedyotis* the pericarp of which becomes more or less fleshy, although its two halves often separate at maturity. The latter is rather an Australian *Hedyotis* in which the apical independence of the ovary or of the fruit is more marked than in *Leptoscela*, *Lucya*, *Houstonia*, &c.; so that only the lower half of the gynæcium is encased in the receptacular capsule, the upper half being free. The fruit is capsular or loculicidal. *Coccocypselum* in its habit and foliage resembles some hairy and creeping *Menthas*, and *Synaptantha* has in habit been compared to certain humble *Caryophyllaceæ* such as *Sagina*.

By its half free gynæcium, *Synaptantha* forms a link between *Oldenlandia* and a genus here quite abnormal, *Mitreola*.[1] In the latter the fruit is sensibly free and superior. But in the flower the receptacle is slightly concave and the ovary is semi-inferior, that is "adherent" in its lower part. Moreover the two ovarian cells enclose the pluriovulate placenta of *Oldenlandia;* the corolla is gamopetalous, pentamerous and valvate, and the fruit is a capsule, compressed perpendicular to the partition, obtriangular, truncate or deeply bilobed at the summit. They are annual or perennial herbs of the warm and temperate regions of Asia, Australia and America, with opposite leaves connected by small stipules; axillary and terminal flowers disposed unilaterally on the slender axes of a dichotomous cyme, similar to that in the sections *Leptoscela*, *Hekistocarpa*, &c., of *Oldenlandia*. What *Gærtnera* is to

Synaptantha tillæacea.

Fig. 318. Long. sect. of flower (§).

[1] Another genus which plays here the same intermediate part and which approaches very near to those under consideration, is *Polypremum* (fig. 319, 320), often referred to the *Loganiaceæ*, and appears to us near *Synaptantha*. Its flowers, 4, 5-merous, have an ovary almost entirely free, as also its capsular, subdidymous, loculicidal fruit. But its corolla is more or less imbricate, which renders it abnormal in this series. It is an American herb, whose habit and foliage recall those of *Synaptantha*, whose petioles are dilated and connate at the base, and flowers subsessile in the dichotomies of a foliate cyme.

Uragoga, *Mitreola* is to *Ophiorrhiza*, growing in the warm regions of Asia and Oceania: the unilateral inflorescences are there the same as in *Mitreola* and the form of the capsules is nearly always the same. But the receptacle being more concave, the ovary and fruit are in great part inferior, and at a certain height on the sides of the latter (fig. 321) are seen the remains of the calyx and a trace of the margin of the receptacular cup on which the perianth was inserted. Some *Ophiorrhizas*, as *Polyura* and *Pakenhamia*, differ somewhat from the rest in the turbinate or obconical form of the receptacle or in some details of the inflorescence which always consists of uniparous cymes.

Polypremum procumbens.

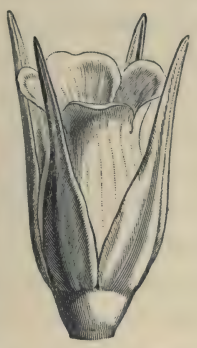

Fig. 319. Flower (§).

Fig. 320. Long. sect. of flower.

Spiradiclis is also a herb of tropical Asia, with flowers in racemiform often unilateral cymes. The concave receptacle is generally traversed by four ridges, and the lobes of the corolla, four or five in number, are valvate. The ovary has two cells, sometimes incomplete, surmounted by a disk with two or four lobes, and the placentas, ascending and pluriovulate, are those of *Ophiorrhiza*, *Oldenlandia*, &c. The fruit is a loculicidal capsule the valves of which often separate in two halves. *Lerchea*, shrubby or subshrubby plants of tropical Oceania, have the flowers of *Oldenlandia*, a fruit of two indehiscent cocci, with a corolla often glabrous within and stylary branches thicker than in those named *Xanthophytum*. In the latter the glomerules or floral cymes are inserted in the axil of the leaves, whilst in the true *Lerchea*, in which

Ophiorrhiza japonica.

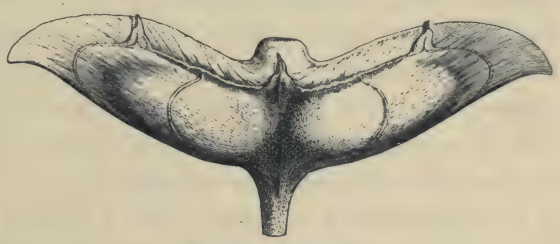

Fig. 321. Fruit (§).

the corolla is hairy within and the style branches are more slender, the partial inflorescences are spread along the entire length of an elongate branch in the axil of bracts which take the place of leaves.

Neurocalyx and *Argostemma* have nearly the same organization. The corolla is rotate and valvate with four or five very deep divisions; and the coriaceous bilocular capsule opens more or less irregularly to release numerous small reticulate or foveolate seeds with fleshy albumen and ovoid embryo. The flowers externally resemble those of certain *Solanaceæ* or *Ardisieæ*. In *Neurocalyx*, annuals inhabiting India, especially Ceylon and Borneo, the calyx is dilated to five large membranous veined lobes, and the introrse anthers unite at the margins in a cone through which passes the style, the stigmatiferous extremity of which is enlarged to a small head. In *Argostemma*, from India, the Indian Archipelago and Guinea, the stem is also herbaceous, often very low, sometimes bearing only one or two pairs of leaves. These, in each pair, are equal or unequal. The flowers are in false umbels, at the end of the axes or oftener in the axils of the leaves. The stamens are also contiguous or united in a cone around the style, entire or capitate, by the bilocular anthers, which open sometimes by clefts, sometimes by one or two pores at the top of a terminal beak. The fruit is a capsule or sort of pyxis.

Virecta (fig. 322, 323) and *Otomeria* belong to a small group of African plants in which the divisions of the calyx are unequal, and the branches of the style entirely covered with papillæ. In the former the corolla has four to seven valvate lobes. The throat is glabrous whilst it is hairy in those forming the genus *Pentas*. The true *Virecta* has simple or bilobed stipules on each side whilst those of *Pentas* are divided into setiform strips. In the two ovarian cells is a thick placenta, inserted in the partition by a narrow point, sessile or stipitate and multiovulate. The fruit is capsular and loculicidal, one only of the valves being persistent in the true *Virecta*, both in *Pentas*. In all, the flowers are in compound cymes resembling umbels or corymbs. *Otomeria*, a near neighbour of the preceding genus, has a valvate-induplicate corolla, and a septicidal fruit, the two cocci of which open internally, surmounted, one by three, the other by the two remaining divisions of the calyx, the divisions being usually unequal.

The two abnormal genera *Carlemannia* and *Silvianthus*, both from Eastern India, have 4, 5-merous flowers in cymes similar to those of

the preceding genera; but the androecium consists of only two enclosed stamens inserted on the tube of the corolla. In the former

Virecta (*Pentas*) *carnea*.

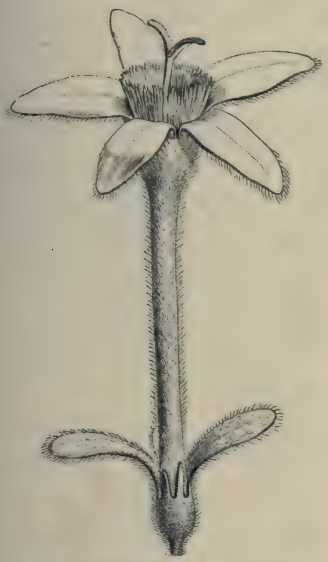

Fig. 322. Flower (½).

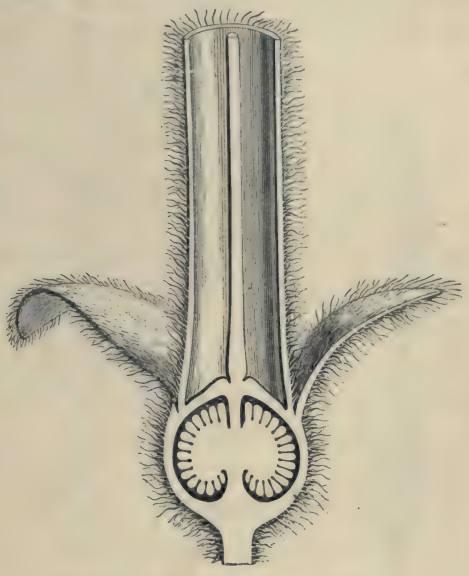

Fig. 323. Long. sect. of base of flower.

the fruit is a bivalve and loculicidal capsule; in the latter it is less dry and opens from top to bottom in five pannels, although, like that of *Carlemannia*, it has only two polyspermous cells. In both the seeds are small and numerous.

X. PORTLANDIA SERIES.

Portlandia[1] (fig. 324–330) often has regular flowers of five and more rarely four parts. The inferior ovary is obconical and bilocular, surmounted by an entire or lobed disk, and by a style the stigmatiferous extremity of which is truncate, or slightly enlarged, nearly entire or

[1] P. Br. *Jam.* 164, t. 11.—L. *Gen.* n. 227.—Gærtn. *Fruct.* i. 153, t. 31.—Rich. *Rub.* 206.—DC. *Prodr.* iv. 404.—Endl. *Gen.* n. 3258.—B. H. *Gen.* ii. 45, n. 50.—H. Bn. *Adansonia*, xii. 296.—*Gonianthes* A. Rich. *Fl. Cub.* t. 49bis (not Bl.).

divided into two little developed stigmatiferous lobes. The calyx has four or five elongate, pointed lobes, often glandular or papillose below, within and at the margin. The corolla, most frequently regular straight, tubular-campanulate or funnel-shaped, 4, 5-gonal, has, it is said, reduplicate and valvate lobes, but much oftener

Portlandia (*Coutaportla*) *Ghiesbreghtiana*.

Fig. 324. Bud ($\frac{2}{1}$).

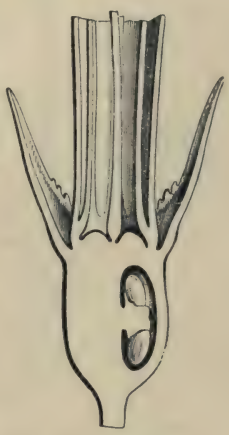

Fig. 327. Long. sect. of base of flower.

Fig. 325. Flower.

Fig. 329. Seed ($\frac{6}{1}$).

Fig. 326. Diagram.

Fig. 328. Dehiscing fruit.

Fig. 330. Long. sect. of seed.

imbricate at the margins. The andrœcium is formed of as many stamens, the bilocular anthers of which are generally basifixed, and the filaments, inserted quite at the bottom of the corolla, are at this point united by a short little-prominent ring, but free throughout their remaining extent. The two cells enclose a placenta attached to the partition by a narrow support and bearing most frequently a great number of ovules. The fruit is an obovate capsule, more or less

compressed perpendicular to the partition and loculicidal in its upper part, that is above the calyx which persists to the fruit below the summit. The seeds, compressed-angular, often surrounded by an aril which extends to the funicle, have a fleshy albumen and an embryo occupying half or two-thirds of its length; it has a cylindrico-conical radicle and flattened cotyledons, oval or elliptic. They are small trees and shrubs of the Antilles and warm parts of Mexico. The leaves are opposite, elongate, entire, coriaceous, with interpetiolar stipules, and the flowers[1] are axillary, united in pedunculate, 3-flowered cymes, often reduced to one or two flowers.

In *P. Lunæana*, from Guatemala, type of a section *Tacourea*,[2] the axillary flowers are solitary; the dehiscence of the fruit is septicidal, and the margin of the seed is dilated to a short circular wing. In another, *Portlandia*, from St. Domingo, of which the genus *Isidorea*[3] has been made, the flowers, solitary and axillary, have a pentamerous, subvalvate corolla; the fruit is septicidal, the seed arillate, and the leaves rigid, terminating in a point. In *Coutarea*,[4] from tropical America, the corolla, decidedly imbricate, is often curved and gibbous on one side; the seeds are bordered by a small circular wing as in *Tacourea*, and the 1–3-flowered cymes are axillary or subterminal. *Coutaportla*,[5] which connects the true *Portlandia* with *Coutarea*, has a tetramerous flower, a somewhat irregular angular corolla, with reduplicate and imbricate lobes, and two ovarian cells the placentas of which bear only two or three descending and the same number of ascending ovules (fig. 327). The capsule is loculicidal and more or less septicidal at the summit (fig. 328); the sepals separate from it, but not so early as in *Coutarea;* and the seeds are rounded or ellipsoid, flat and thin at the margin, but without wing. They are Mexican plants with axillary flowers, small and solitary.

Thus defined, this genus contains some fifty species of American woody plants,[6] some of which are not yet described.

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[1] Ordinarily large, handsome, white, yellowish or red, often odorous.

[2] H. Bn. *Adansonia*, xii. 302.

[3] A. Rich. *Rub.* 204, t. 15, fig. 1.—DC. *Prodr.* iv. 405.—Endl. *Gen.* n. 3250.—B. H. *Gen.* ii. 46, n. 51.

[4] Aubl. *Guian.* i. 314, t. 122.—J. *Gen.* 202; *Mém. Mus.* vi. 388.—Gærtn. f. *Fruct.* iii. 79, t. 194.—Lamk. *Ill.* t 257.—Rich. *Rub.* 207.—DC. *Prodr.* iv. 350.—Endl. *Gen.* n. 3278.—B. H. *Gen.* ii. 42, n. 38.

[5] H. Bn. *Adansonia*, xii. 300.

[6] Smith, *Ic. Pict.* i. t. 6.—Jacq. *Amer.* t. 44, 182, fig. 20 (*Coutarea*).—Pohl, *Pl. Bras. Ic.* t. 200 (*Coutarea*).—Griseb. *Fl. Brit. W.-Ind.* 323 (*Coutarea*), 324; *Cat. Pl. Cub.* 126.—Hemsl. *Diagn. Pl. Nov. Mexic. et Centr. Amer.* 31.—*Bot. Mag.* t. 286, 4534.—Walp. *Rep.* ii. 506, 510 (*Coutarea*); *Ann.* ii. 776.

Bikkia, in tropical Oceania, is the counterpart of *Portlandia*; it has 4, 5-merous flowers with a straight or curved corolla, highly reduplicate. The tetragonal ovary, surmounted by a style the two slender branches of which are spirally twisted, contains two cells, the placenta of which, on transverse section, is T-shaped with branches more or less revolute bearing ovules on one or both faces. The fruit is a septicidal capsule, the exocarp of which, thin or fibrous, finally separates from the hard and thin endocarp, and the seeds are compressed or bordered with a thick wing. They are shrubs with large interpetiolar stipules, flowers solitary or in corymbiform cymes, axillary or terminal. *Morierina*, a shrub of New Caledonia, differs little from *Bikkia*: it has the same habit and foliage; compound and corymbiform terminal cymes; a short calyx with five teeth; a long and straight corolla with elongate valvate lobes; stamens inserted at the bottom of the corolla and monadelphous at the base; numerous imbricate ovules, the lower covering the upper; a style with stigmatiferous extremity scarcely sloped; a thick conical disk; a polyspermous capsule, and numerous seeds with coat dilated to a thick wing.

Condaminea, which has given name to a part of this series (*Condamineæ*), has also a valvate coriaceous short bell-shaped corolla, surrounded by a calyx which separates circularly at the base; five dorsifixed anthers, opening by longitudinal clefts, and a turbinate capsule, loculicidal from top to bottom, having numerous wedge-shaped seeds, with reticulate testa. They are trees and shrubs of western tropical America, with large opposite leaves, bipartite intrapetiolar stipules, flowers in compound or corymbiform pedunculate cymes. *Rustia* has flowers similar to those of *Condaminea*, but with a short and persistent calyx, a longer and narrower corolla, anthers opening only at the summit by pores or short clefts, basifixed and not dorsifixed. They are trees of tropical America whose inflorescences are large terminal and compound clusters of cymes. *Pinckneya* (fig. 331) has nearly the same valvate tubular and elongate corolla, five stamens inserted lower, with versatile anthers; but the calyx has dissimilar divisions; three or four of them are narrow, pointed; one or two are dilated to a broad coloured petiolate layer. In those named *Pogonopus*, the corolla, instead of being tomentose internally, is glabrous. The fruit is ovoid, whilst in the true *Pinckneya* it is more globular and subdidymous. They are shrubs of

the two Americas, with rather large and showy flowers in terminal or axillary clusters of cymes.

Rondeletia, a name given also to a tribe of *Rubiaceæ*, is placed at the head of a subseries with capsular fruit, seeds generally without or with very short wings, as in all the preceding types; but with corolla strictly imbricate instead of valvate. Its lobes are normally four or five in number. The tube is generally thickened at the throat beyond which the anthers do not pass. The fruit is loculicidal, and the valves may separate. The seeds are very variable in form, cubical, or angular, or fusiform, or compressed and even winged. They are trees or shrubs of tropical America with opposite or ternate leaves and flowers in terminal clusters of cymes. *Rhachicallis rupestris* has the tetramerous flowers of *Rondeletia*, but they are solitary and axillary. It is a small shrub from the maritime rocks of the Antilles, with small whitish fleshy leaves and stipules united in an enlarged and ciliate sheath. The fruit is capsular, partly superior, and septicidal. *Bathysa* has also a septicidal capsule. They are Brazilian trees or shrubs, often downy. The small flowers are terminal, in ramified clusters of cymes, 4, 5-merous, with short corolla, imbricate or contorted, and exserted stamens inserted at the mouth of the corolla. The seeds are angular, compressed or bordered with a narrow rudimentary wing.

Pinckneya pubens.

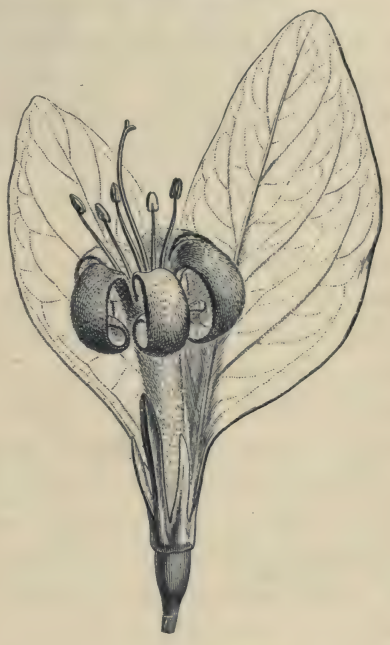

Fig. 331. Flower.

Wendlandia is the old world analogue of the American *Rondeletia*. It has the imbricate, or oftener perhaps contorted corolla of 4, 5-divisions; stamens inserted near the mouth of the corolla; an ovary with two multiovulate cells, surmounted by a style the stigmatiferous extremity of which, enlarged or claviform, is bilobed

or nearly entire. They are shrubs of tropical Asia and Oceania; one growing as far as Kurdistan. The leaves are opposite or rarely verticillate. The flowers are in clusters of cymes and the capsular fruit is sometimes loculicidal, sometimes septicidal.

Chalepophyllum guianense is also very near *Rondeletia*. Its axillary, solitary and pedunculate flowers have an ovary with two multiovulate cells, surmounted by a persistent calyx with five oblong and rigid lobes and an imbricate or contorted corolla bearing enclosed stamens. The fruit is a septicidal capsule with angular and very short-winged seeds. It is a shrub with small opposite obtuse coriaceous leaves, resinous at the points and greyish on the surface when dry.

In *Augusta*, glabrous trees and shrubs of southern Brazil, the flowers have a long tubular corolla, straight or curved, with five short and contorted lobes. In other respects, the flower closely resembles those of *Portlandia* and *Bikkia* with narrow corollas. The fruit is also, as in the latter, a capsule the coat of which unfolds in two layers and the endocarp divides into four curled pannels. The seeds are cubical or polyhedral. The flowers are in three-flowered axillary cymes. In *Lindenia* the corolla is still longer and more slender, particularly the tube which is very narrow. The limb is hypocrateriform with five contorted lobes. The stamens are exserted and the coat of the pericarp unfolds, as in the preceding genus. They are elegant shrubs of Mexico and New Caledonia with lanceolate leaves, connate intrapetiolar stipules and flowers in terminal cymes.

In the following genera the flowers are small and the corollas short, as in *Rondeletia*, *Bathysa*, &c. That of *Elæagia* is subrotate, with five contorted lobes, afterwards recurved. The exserted stamens, with filament geniculate and hairy below, recall those of *Chimarrhis* and *Sickingia*, the analogues of *Elæagia* among the types with imbricate corolla, as well by their flowers as by their small loculicidal capsules with bifid valves, and their inflorescences, still more compound and ramified in *Elæagia*, large trees of Peru and Columbia with resinous sap. *Greenea* comprises erect or climbing shrubs of tropical Asia and Oceania, glabrous or pubescent, whose small capsules are similar to those of *Elæagia*, with angular compressed or short-winged seeds, and whose flowers, in long compound clusters of cymes, partly uniparous, are small, sessile or nearly so, as in some *Oldenlandias* (*Hekistocarpa*, *Leptoscela*, &c.). But the short corolla

is contorted and much resembles that of some species of *Hypobathrum*, a genus in which the fruit is fleshy.

Deppea, a small Mexican shrub, has tetramerous flowers, with rotate or short funnel-shaped contorted corolla; anthers often apiculate, with cells independent below, and a bilocular ovary with ovules inserted on an oblong and peltate placenta; surmounted by a style often capitate, more rarely bifurcate at the summit. The fruit is a small obovoid or turbinate capsule. The inflorescences are axillary cymes, often few-flowered, loose or umbelliform.

Deppea cornifolia.

Fig. 332. Long. sect. of flower (½).

The true *Sipanea* has the flowers of *Rondeletia*, but with contorted corolla. The calycinal divisions are lanceolate and subfoliaceous in those named *Limnosipania* in which the stamens are exserted and the leaves verticillate, whilst in *Sipanea* proper the sepals are subulate, the stamens enclosed and the leaves verticillate. They are annual or perennial herbs of tropical America, with flowers in axillary and terminal, often corymbiform cymes.

XI. CINCHONA SERIES.

The *Cinchonas*[1] (fig. 333–341) have hermaphrodite regular and pentamerous flowers. The receptacle is sac-like in form, the cavity

[1] *Cinchona* L. *Gen.* n. 228.—J. *Gen.* 201.—Lamb. *Ill. Cinchon.* (Lond. 1797). — Ruiz, *Quinolog.* (Madr. 1792).—DC. *Bibl. Gen.* (1829) ii. 114; *Prodr.* iv. 351. — Rich. *Rub.* 202.—Endl. *Gen.* n. 3274.—Wedd. *Revue du Genre* Cinchona (*Ann. Sc. Nat.* ser. 3, x. 5); *Hist. Nat. des Quinq.* (Paris, 1849).—Howard, *Ill. Nuev. Quinolog. Pavon* (Lond. 1862).—Triana, *Nouv. Et. Quinq.* (Paris, 1870).—B. H. *Gen.* ii. 32, n. 9. (Linnæus wrote, by mistake perhaps, *Cinhona* in his *Genera*, in 1767. Several authors, particularly Mr. Markham, have recently proposed to adopt in preference the name *Chinchona*, which is more correct; and although

being filled with the adnate ovary and the margin bearing the perianth. The latter consists of a short gamosepalous persistent

Cinchona Calisaya.

Fig. 333. Floriferous branch (¼).

calyx, with five teeth not contiguous even in the bud,[1] and a gamosepalous hypocrateriform corolla, with a long nearly cylindrical

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this proposition has met with little success, so great is the influence of custom, it is not unreasonable, since generic names, at first incorrectly written, have often been reformed.)—*Kinkina* Adans. *Fam. des Pl.* ii. 147.

[1] Short glandular tongues, single or double, may be interposed; they are perhaps of a stipulary nature.

tube and limb divided into five valvate expanded lobes, externally almost entirely covered with hairs, internally only in certain parts. In the lower part of the tube, the corolla bears five stamens,[1]

Cinchona Calisaya.

Fig. 334. Flower ($\frac{4}{1}$).

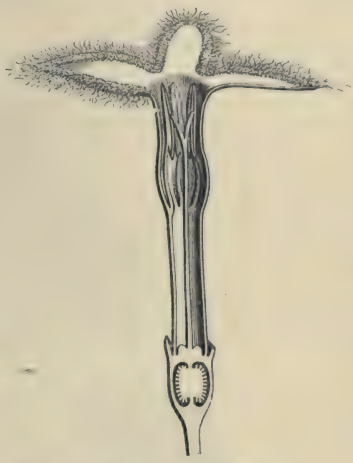

Fig. 335. Long. sect. of flower.

alternate with its divisions, and formed each of a filament of variable length and an anther enclosed (or slightly exserted at the summit),

Cinchona Calisaya.

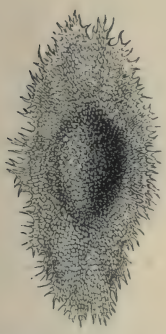

Fig. 337. Seed ($\frac{10}{1}$).

Fig. 336. Dehiscing fruit.

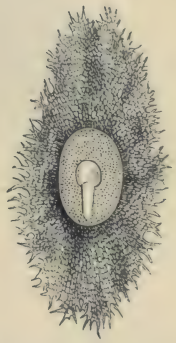

Fig. 338. Long. sect. of seed.

bilocular,[2] introrse, dehiscing by two longitudinal clefts, oscillating. The inferior ovary has two cells, one anterior, the other posterior;

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[1] Parallel to the filaments, this tube has five vertical slits, the formation of which presents a curious object of study, and through them the back of the filament may be reached. These slits are also met with in a great many *Rubiaceæ* and render the corolla of some almost completely polypetalous.

[2] The two anther cells are independent below.

it is surmounted by a circular epigynous disk, surrounding the base [1] of an erect style generally short,[2] divided above into two thick obtuse stigmatiferous lobes, covered internally with papillæ. In

Cinchona officinalis.

Fig. 339. Floriferous branch ($\frac{1}{10}$).

the internal angle of each ovarian cell is a placenta bearing a great number of pluriseriate ascending anatropous ovules, with inferior micropyle.[3] The fruit is a capsule, surmounted by the non-accrescent and hardened sepals; more or less elongate and separating, by division of the partition, into two mericarps each opening by the

[1] Here suddenly contracted.

[2] With regard to the length of the style the flowers may be dimorphous like those of many other *Rubiaceæ*, and the fact is perhaps of importance in fecundation.

[3] With a single coat, very incomplete.

ventral line and liberating the narrow and elongate polyspermous placenta. The seeds are ascending, imbricate, subpeltate, flat and

Cinchona officinalis.

Fig. 340. Fructiferous branch ($\frac{1}{3}$).

furnished with a wide marginal wing, a dilatation of the coat, the elliptic or oblong[1] cavity of which encloses a flattened, fleshy, often

[1] The wing is unequally elliptical, thin, translucent, finely and irregularly laciniate at the margin with delicate ciliate divisions. The central portion occupied by the albumen, much compressed, is sometimes called the nucleus of the seed. The seed is attached near the middle of this. The placenta is smooth within, traversed lengthwise by a median suture. Externally it has unequal depressions in which the seeds are lodged near the middle of which is a small circular surface of insertion. The embryo is half or a little more the length of the albumen and erect.

thin albumen, enveloping a small straight embryo, with cylindrical inferior radicle and elliptical or oval and flattened cotyledons.

The *Cinchonas*, of which there are in reality only a score of species[1]

Cinchona succirubra.

Fig. 341. Floriferous branch ($\frac{1}{3}$).

though double or more have been distinguished, are trees and shrubs of the Andes of the northern part of South America. The leaves

[1] H. B. *Pl. Æquinoct.* t. 10, 47.—R. et Pav. *Fl. Per.* t. 191, 192, 194, 195, 224.—Miq. *De Cinch. Spec. Quibusd. Ann. Mus. Lugd.-Bat.* iv. 263.—Markh. *Cinch. Spec. New-Gran.* (Lond. 1867).—Wedd. *Ann. Sc. Nat.* ser. 5, xi. 346; xii. 24.—How. *Bull. Soc. Bot. Fr.* xvii. t. 3; *Quinol. East Ind. Plantat.* (Lond. 1876).—G. Pl. *Des Quinq.* (Par. 1864); *Dict. Encycl. Sc. Méd.* ser. 3, i. 272.—Karst. *Fl. Colomb.* t. 8–12, 22, 23, 26 (1861); *Medic. Chinar. N.-Gran.* (Berl. 1858).—Hook. f. *Bot. Mag.* t. 5364, 6052.—Walp. *Rep.* ii. 509; vi. 64; *Ann.* ii. 782; v. 128.

are opposite,[1] petiolate, penninerved,[2] accompanied with interpetiolar stipules, furnished internally with basilar glands and falling early. The flowers[3] are in terminal ramified and compound clusters of cymes, often uniparous near the extremity, with bracteoles which may here and there become foliaceous.

Several of the following genera, very near *Cinchona*, are distinguished by characters of little value and even artificial. *Cascarilla* (fig. 342) has the flowers of *Cinchona* except that the lobes of the corolla are papillose instead of pubescent at the margin; and the capsular fruit opens from top to bottom and not from the bottom upwards. All the other characters are similar and they are trees and shrubs from the same regions, but the area of vegetation extends further east. *Remijia*, like *Cascarilla*, has been referred to the genus *Cinchona*. The inflorescences are terminal. The gamosepalous calyx, more or less developed, is sometimes a little irregular, and the narrow fruit opens from top to bottom like that of *Cascarilla*. They are shrubs from the same countries. *Ladenbergia*, trees of Peru and Columbia, has also nearly the flowers of *Cascarilla*, often more elongate, disposed unilaterally on the slender divisions of a compound cyme. The style is terminated by a punctiform stigmatic surface, and the fruit is a narrow and elongate capsule, enclosing numerous imbricate seeds, winged at both ends, the inferior or both bilobed. The pericarp is thick and dehisces from top to bottom along the partition; the two valves are bifid at the summit and often contorted.

Cascarilla Gaudichaudiana.

Fig. 342. Dehiscing fruit.

In *Macrocnemum*, the pentamerous flowers have a corolla with expanded and valvate limb, often very reduplicate, and an andrœcium

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[1] They are exceptionally ternate.

[2] The axil of the secondary nervures may be surrounded below by small concave glands.

[3] White, pink or reddish, sometimes, it is said, yellowish, ordinarily odorous.

of five unequal enclosed stamens with short and rounded anthers. The capsule is loculicidal, and the imbricate seeds are winged top and bottom. They are trees and shrubs of tropical America, with opposite leaves, and the inflorescences, axillary and terminal, are in very ramified clusters of cymes.

This series is also represented by several old-world genera, some of which have been referred to the genus *Cinchona*, as *Hymenopogon*, from the Himalaya, having the septicidal capsule of *Cascarilla*, with winged seeds, a valvate corolla with the internal hairs reversed, and flowers in terminal corymbiform cymes, the bracts of which may present exactly the same characters as the foliaceous sepal of *Macrocnemum*; *Hymenodictyon*, from India and tropical Africa, with short pedicels (so that the divisions of the inflorescences become spikelike), bracts also foliaceous, petiolate and reticulate, and fruit capsular and loculicidal, not septicidal. *Corynanthe* is a tree of Guinea with loculicidal capsule, winged seeds, valvate corolla; but the lobes of the latter are furnished near the summit with a long narrow club-shaped appendage, and the secondary divisions of the mixed inflorescence are nearly verticillate. *Danais*, exclusively domiciled in the eastern tropical African isles, consists of climbing shrubs with polygamo-dicœcious flowers. The corolla is valvate, with five stamens, exserted in the males, short and enclosed or absent in the females. The style is short with bare branches in the male flowers, long exserted and with branches terminated by a papillose cone in the female. The fruit is a short loculicidal capsule, and the seeds, imbricate and peltate, are bordered by a circular wing. The floral cymes are compound and corymbiform, axillary.

There is one genus, *Manettia*, in America whose stems are also slender and volubile, and the inflorescences, short and axillary, sometimes few- or one-flowered. But they are herbaceous or sub-shrubby plants. The flowers are 4, 5-merous, with a corolla often tubular, limb valvate, and an ovary with two multiovulate cells, surmounted by a long slender style, entire or bifid. The capsule is septicidal; the seeds imbricate and surrounded by a dentate wing. The placenta, erect or ascending, is supported by a short foot, which connects these plants with the *Oldenlandieæ*. In *Alseis*, likewise inhabiting tropical America, the flowers are also polygamous, with a placenta attached to the ovarian coat by a contracted point; but it is descending, and the flowers are in clusters with short pedicels,

or in spikes, simple or little ramified at the base, axillary and terminal. The corolla is valvate and the fruit septicidal.

Cosmibuena gives name to a subseries (*Cosmibueneæ*) in which the flowers have the same general organization as in the preceding types, and the capsular fruit also contains winged seeds, but with a contorted, not valvate corolla. It comprises equally old-world types and American genera. They are: *Cosmibuena*, from tropical America, having large terminal flowers, solitary or in three-flowered or compound cymes, with a corolla of which the torsion is sometimes from right to left, sometimes from left to right, an elongate style, claviform and bifid at the summit, and a septicidal fruit; *Ferdinandusa*, trees or climbing shrubs from the Antilles and the east of South America, with long and narrow corolla, the limb of which, somewhat unsymmetrical, is divided into four lobes resembling a perianth slightly bilabiate, four unequal stamens, two few- or many-seeded ovarian cells, a septicidal capsule and terminal compound clusters of cymes; *Ravnia*, from Costa-Rica, an epiphytal shrub with 5, 6-lobed contorted corolla, an ovary of two multiovulate cells, the fruit of which is unknown and the habit said to be that of *Æschynanthus*, with subsessile flowers in terminal three-flowered cymes; *Capirona*, a Brazilian tree with coloured bark easily separable from the wood, having large opposite oboval leaves, compound terminal cymes, 5, 6-merous flowers, somewhat irregular or regular; contorted corolla, the throat of which is glabrous, staminal filaments united at the base, and capsular, septicidal, polyspermous fruit, similar to that of *Cascarilla*.[1]

In the old world this group is equally represented by four genera: *Dolicholobium*, shrubs of the Viti isles, whose axillary flowers,

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[1] We here doubtfully place *Platycarpum*, which with the congeneric *Henriquezia*, has been ranged in a distinct tribe (*Henriqueziæ*) and has also been referred to other families. The flowers are hermaphrodite, with irregular pentamerous corolla, like those of the true *Capirona*, but more oblique and imbricate. The five stamens are nearly the same. The calyx has only four divisions and separates at the base from the shallow concave receptacle, in which is lodged the ovary with two 2-4-ovulate cells. The fruit becomes a large woody capsule, compressed perpendicular to the partition, orbicular or didymous, dehiscing at the margin and loculicidal. Each cell contains 1–4 seeds, bordered by a broad wing and said to be without albumen. In the true *Platycarpum*, the fruit becomes almost completely superior, whilst in those of the section *Henriquezia*, the circular scar of the margin of the receptacle is seen about one-third the height above the base. In the flower this margin is lined by an epigynous or slightly perigynous disk with 4–10 small lobes. They are trees of northern Brazil and Venezuela having opposite or more rarely verticillate leaves with interpetiolar caducous stipules; glabrous or hairy, with rather large handsome flowers in terminal clusters of cymes.

solitary or terminal and united in three-flowered cymes, are those of a *Gardenia*, with hypocrateriform, contorted, 4, 5-lobed corolla, but the siliquiform fruit is said to be septicidal, with ovoid seeds having a long caudile prolongation at each end; *Coptosapelta*, climbing shrubs of the Indian Archipelago, whose clusters of cymes are terminal and pendent, and the flower also that of a *Gardenia*, with a contorted hypocrateriform or tubular corolla, a globular loculicidal fruit and seeds with broken marginal wing; *Crossopteryx*, from tropical Africa, the corolla of which has 4–6 contorted lobes, the two ovarian cells enclose a peltate placenta bearing, like that of *Tarenna*, several hollows in which the ovules are imbedded, and the fruit of which is also a globular and loculidal capsule; *Mussaendopsis*, from Borneo, the characters of which are those of a *Randia*, with the flower, fruit and seeds of a *Calycophyllum*, but with a corolla contorted and polypetalous or nearly so.

Hillia is also the type of a separate subseries (*Hilliæ*), in which the corolla is generally contorted instead of valvate or imbricate. It is regular or slightly irregular, 3–7-lobed, with the same number of enclosed stamens, and almost sessile anthers. The fruit is capsular and septicidal, folliculiform; and the numerous seeds are furnished below with an elongate tail and above with a long tuft of hairs. They are shrubs of the Antilles and South America, glabrous, often epiphytal, with radicant branches, opposite slightly fleshy leaves and large terminal solitary flowers, nearly sessile.

In *Calycophyllum*, the short flower has a valvate corolla and a calyx the five teeth of which are more or less unequal. One or two of them are developed into large leaflike plates, petiolate and coloured, as in *Pinckneya*. The fruit is a loculicidal capsule, and the seeds, small and numerous, are prolonged at each end to a narrow wing, which may disappear completely or nearly so in those named *Pallasia* and *Warscewiczia*. They are trees and shrubs of the Antilles and South America, with opposite leaves, interpetiolar stipules, flowers in clusters of cymes more or less ramified, often uniparous, scorpioid. One, named *Schizocalyx*, differs from the others in that its calyx, entire and valvate, breaks irregularly at anthesis; it has not unfrequently however a leaflike expansion. The latter is always wanting in those species of *Calycophyllum* named *Enkylista*.

Molopanthera, a Brazilian shrub, has nearly the characters of *Enkylista*, that is an imbricate corolla with 4, 5 narrow lobes; it is

bent in the bud and slightly irregular. The stamens are inserted near the base, and the two ovarian cells enclose a globular, few-seeded placenta supported by an ascending foot. The fruit is a globular-didymous capsule, loculicidal and few-seeded, enclosing peltate seeds with a marginal wing. The inflorescences are terminal and axillary, in clusters of cymes. *Thysanospermum*, a low creeping shrub of Hongkong, with small leaves resembling those of certain *Caprifolieæ* and small axillary and solitary flowers, has an imbricate or contorted, hypocrateriform corolla, glabrous internally, and a short didymous loculicidal capsule, with orbicular peltate seeds bordered with a slashed wing. In *Exostema*, which are American, chiefly from the Antilles, and of which one Oceanic species has received the name of *Badusa*, the corolla is equally imbricate, tubular-hypocrateriform, sometimes with a very long tube. The stamens, often long exserted, have filaments inserted quite at the base of the corolla and sometimes almost independent of it, often monadelphous at the base for a very short extent, and basifixed or dorsifixed anthers. The stigmatiferous summit of the style is ordinarily entire or with shallow divisions, and the fruit (fig. 343) is septicidal with entire or bipartite valves. The seeds are imbricate and prolonged above and below in wings of very variable form. The flowers are axillary and terminal, solitary or in cymes, most frequently corymbiform.

Exostema caribæum.

Fig. 343. Dehiscing fruit.

Luculia comprises Indian shrubs with opposite leaves and interpetiolar stipules, whose fine flowers are in terminal compound cymes with short pedicels, the corolla hypocrateriform, imbricate; stamens inserted on the tube; a two-celled ovary with revolute multiovulate placentas, and an obovate, coriaceous, septicidal fruit with two bipartite valves and small seeds prolonged at both ends to an elongate and lacerate wing.

Chimarrhis, exceptional in this group as they would be in any other in which they might be placed, has numerous flowers in clusters of cymes, generally small. The corolla, gamopetalous to a very variable point, sometimes very high, bears five small lobes above, rounded or obtuse, often contracted at the base and imbricate at the

margin, but generally to a small extent. The stamens are of two kinds according as we examine this or that flower with filaments sometimes short and sometimes long, thick and exserted as in *Sprucea*, the flower of which is of an intensely red colour in most parts. The fruit is a small short capsule, septicidal and loculicidal; and the seeds, said to be "winged" in those called *Sickingia*, have, in *Chimarrhis* proper, only a short marginal wing or even almost none. They are trees of tropical America, with opposite leaves, accompanied with stipules; sometimes very large, sometimes cordate, and sometimes very long attenuated at the base.

In a group somewhat exceptional have been united *Nauclea* (fig. 344) and some other genera resembling them in their capituliform inflorescences (in reality capitules of glomerules), terminal and oftener axillary, pedunculate; and this group has even been raised to the rank of a tribe (*Naucleeæ*). The flowers have a calyx with folioles of variable form, often claviform, as the bracts and bracteoles between the flowers; and the corolla, tubular, most frequently 5-lobed, is imbricate in nearly all the species, or valvate in those separated under the name of *Mitragyne*. The ovary has two cells in each of which a placenta ordinarily descending bears numerous ovules, which may be reduced to a very small number (2, 3) in certain species of which the genus *Adina* has been formed. The fruit is drupaceous, but with a very thin exocarp easily separable from the endocarp, which divides into two hard septicidal and loculicidal cocci. The seeds are more or less prolonged to a wing at each end and are furnished with a fleshy albumen.[1]

Nauclea (*Mitragyne*) *inermis*.

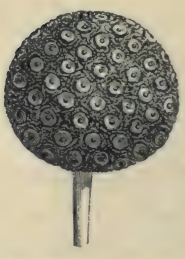

Fig. 344. Compound fruit.

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[1] *Adina* may have only two or three descending ovules in each cell and the corolla very slightly imbricate or even valvate. In this respect it is intermediate on the one hand between other species of *Nauclea* and *Cephalanthus*, and on the other hand between *Nauclea* proper and *Mitragyne*. We call *Micradina* the small Chinese species the corolla of which is often valvate and the ovules few. In *Adinium*, another section, represented by a plant of Madagascar, the ovules may be three, but may be more in the same plant. Here the corolla is distinctly imbricate; but the leaves are verticillate, and the common peduncle, long and slender, bears, at a certain distance below the inflorescence, two or three bracts forming a small involucre.

Cephalanthus (fig. 345–348) may be considered as *Nauclea* with an imbricate corolla, a descending ovule, cocci with monospermous endocarp, and seed without wing, but surrounded by a fleshy aril

Cephalanthus occidentalis.

Fig. 345. Flower (½).

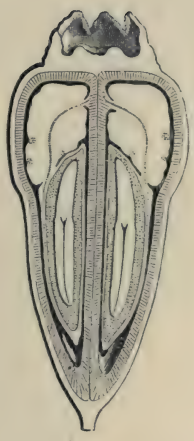

Fig. 347. Long. sect. of fruit.

Fig. 348. Seed (½).

Fig. 346. Long. sect. of flower.

which extends from the umbilicus to the funicle itself (fig. 347, 348). They are shrubs of warm and temperate America, "southern Africa" and tropical and North America, with opposite leaves and mixed, capituliform, terminal and axillary inflorescences.

Ourouparia (fig. 349–354) has the inflorescence of *Nauclea* and *Cephalanthus*, axillary and almost always pedunculate. Very often, the flowers aborting, there remains only the peduncle, which is transformed to an axillary hook, with inferior cavity. The axes of various grades of cymes forming the inflorescence may be contracted and very short, but they are often elongated, especially in the fruit which consists of elongate septicidal capsules, with their bipartite valves. The imbricate seeds are furnished at both ends with a long wing, entire or bilobed. They are climbing shrubs, sustained by

their axillary hooks, inhabiting the tropical regions of Asia and Oceania,

Ourouparia Gambir.

Fig. 349. Floriferous branch.

more rarely western Africa, Madagascar and even South America.[1]

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[1] From the form of its inflorescence we have called an imperfectly known plant of Madagascar *Paracephælis*, the flower of which has a valvate (?) corolla and five oval-pointed

Sarcocephalus is exceptional in this group in the relation of its flowers to the globular or ovoid axis of the inflorescence. In fact the ovaries, like those of *Morinda* and several other genera, are

Ourouparia Gambir.

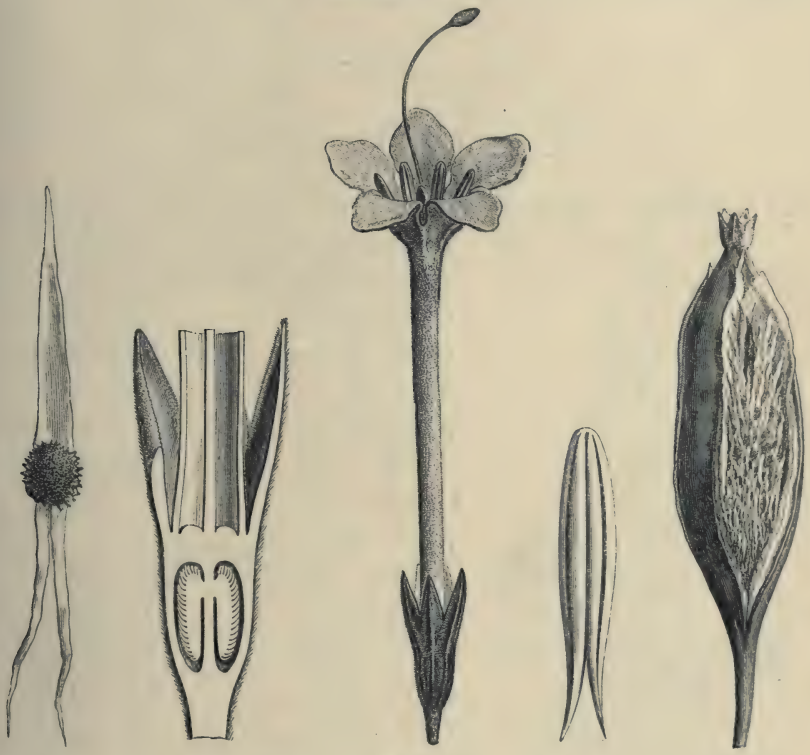

Fig. 354. Seed ($\frac{8}{1}$).

Fig. 352. Long. sect. of base of flower.

Fig. 350. Flower ($\frac{3}{1}$).

Fig. 351. Stamen.

Fig. 353. Dehiscing fruit ($\frac{2}{1}$).

inserted in the cavities of the common axis of the inflorescence to which they are adnate, and the compound fruit which results represents this entire inflorescence become fleshy. The 5–6-merous flowers, moreover, have an imbricate corolla and a bilocular ovary, with ovules variable in number, even solitary, on a suspended placenta. The two cells may be divided by a false partition into incomplete cellules, as in *Anthocephalus*. They are trees or shrubs, sometimes climbing, of tropical Asia and Africa. The leaves are

---

coriaceous and persistent sepals. The ovary has two cells each containing a peltate placenta bearing a small number of orbicular and compressed ovules. It is a tomentose shrub, with terminal inflorescences, bearing only two opposite cordate leaves at the end of each branch.

opposite, often coriaceous, with interpetiolar stipules. The inflorescences are terminal and axillary false-capitules. In those forming the genus *Breonia*, shrubs of Madagascar, the common peduncle may bear a spathelike involucre at first enveloping the inflorescence, then prolonged above it in a sort of long horny beak.

XII. DIERVILLA SERIES.

The flower and fruit in *Diervilla*[1] (fig. 355–359) are in construction the same as in many *Cinchoneæ;* but the leaves are without stipules. The floral receptacle, in the form of an elongate gourd with narrow neck, bears on its margin five elongate sepals, united at the base, often persistent. The corolla, funnel- or bell-shaped, is nearly regular. One of its five lobes, however, the anterior, often differs somewhat from the rest, particularly in coloration, and its base is accompanied with a gland of variable form, not found

Diervilla (*Weigelia*) *japonica.*

Fig. 355. Floriferous branch ($\frac{1}{8}$).

Diervilla acadiensis.

Fig. 356. Long. sect. of flower ($\frac{1}{1}$).

[1] T. *Act. Acad. Par.* (1706) t. 7, fig. 1.—L. *Hort. Cliff.* 63, t. 7.—J. *Gen.* 211.—DC. *Prodr.* iv. 330.—Spach, *Suit. à Buffon*, viii. 359.—Endl. *Gen.* n. 3336; Suppl. i. 1394.—A. DC.

within the four others. The præfloration is imbricate. The andrœcium is composed of five stamens, alternate with the lobes of the corolla and inserted on the tube, composed of a filament and a bilocular introrse anther dehiscing by two longitudinal clefts. The ovary is inferior with two cells,[1] complete or incomplete, and is

Diervilla (*Calyptrostigma*) *Middendorffiana*.

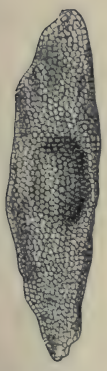

Fig. 358. Seed (6/1).

Fig. 357. Dehiscing fruit (2/1).

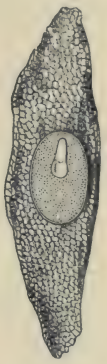

Fig. 359. Long. sect. of seed.

surmounted by a style the stigmatiferous head of which is sometimes obscurely bilobed. Each cell contains numerous ovules, primarily descending, anatropous. The fruit, often surmounted by the calyx, is an elongate septicidal capsule, the seeds of which are bare, angular, or bordered with a wing,[2] sometimes narrow as in some *Weigelas*, and sometimes elongate, as in *D. Middendorffiana* (fig. 357–359), type of a genus *Calyptrostigma*. The small embryo is surrounded by a fleshy albumen. *Diervilla* consists of erect or subsarmentose shrubs of China, Japan and North America. The leaves are opposite, sessile or petiolate, entire or serrate. The flowers[3] are in simple or com-

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Bibl. Genève (Jan. 1839).—H. Bn. *Adansonia*, i. 364.—B. H. *Gen.* ii. 6, n. 11.—*Weigela* Thunb. *Act. Holm.* (1780) 135, t. 5; *Trans. Linn. Soc.* ii. 331; *Fl. Jap.* 6, t. 16.—Lamk. *Ill.* t. 105.—A. DC. *Ann. Sc. Nat.* ser. 2, xi. 237.—*Weigelia* Pers. *Synops.* i. 176.—*Calysphyrum* Bge. *Enum. Pl. Chin. Bor.* 33.—Endl. *Gen.* n. 3339.—*Calyptrostigma* Trautv. et Mey. *Middend. Reis. Fl. Ochot.* 46 (not Kl.).

[1] Sometimes three.

[2] H. Bn. *Adansonia*, xii. 310; *Bull. Soc. Linn. Par.* 202.

[3] Yellow, white, pink or purple.

pound cymes, terminal or axillary, with bracts or bracteoles. Seven or eight species[1] have been distinguished, several of which are often cultivated in our gardens and have there produced numerous varieties.

XIII. HONEYSUCKLE SERIES.

This group derives its name (*Caprifoliæ*) from that of the Honeysuckles which it includes; but they are neither the most

Leycesteria formosa.

Fig. 360. Flower.

Fig. 361. Long. sect. of flower (½).

Fig. 362. Fruit (½).

Fig. 363. Seed (½).

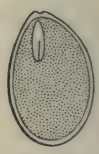

Fig. 364. Long. sect. of seed.

complete nor the most regular type. This we find in *Leycesteria formosa*[2] (fig. 360–364), a small shrub from the mountains of India, often cultivated in our gardens. The flowers have a very deep

[1] A. Gray, *Man.* (ed. 2) 166.—V. Houtt. *Fl. Serr.* t. 211, 855, 1137, 1445–1447 (*Weigelia*).—Sieb. et Zucc. *Fl. Jap.* t. 29–33.—Miq. *Fl. Ind.-Bat.* ii. 128 (*Weigelia*).—*Ill. Hortic.* t. 115, 383, 495 (*Weigelia*).—*Bot. Mag.* t. 1796, 4396, 4893 (*Weigelia*).—Walp. *Rep.* ii. 447, 450 (*Calysphyrum*); *Ann.* i. 365; ii. 732.

[2] Wall. *Roxb. Fl. Ind.* (ed. Car.) ii. 181; *Pl. As. Rar.* t. 120.—DC. *Prodr.* iv. 338.—Endl. *Gen.* n. 3335.—Hook. *Bot. Mag.* t. 3699.—Lindl. *Bot. Reg.* (1830) t. 2.—Wight, *Ill.* ii. t. 121.—Payer, *Organog.* 618, t. 133.—H. Bn. *Adansonia*, i. 355, t. 12; *Payer Fam. Nat.* 235.—B. H. *Gen.* ii. 5, n. 10.—Hook. *Fl. Ind.* iii. 16.

concave gourdlike receptacle, surmounted by a narrow neck. The ovary is lodged in the cavity and the perianth is inserted on the margin of the orifice. The latter consists of a calyx with five unequal divisions, free or nearly so; the two anterior usually much larger than the others; and a regular funnel-shaped corolla, the tube of which is enlarged at the base to a sort of small pouch in which are lodged five glands attached to the walls alternately with the sepals. The limb is divided into five lobes, equal or nearly so, quincuncially imbricate in the bud.[1] The stamens are five in number, inserted in the neck of the corolla, with nearly equal filaments and bilocular introrse anthers dehiscing by two longitudinal clefts. The inferior ovary is surmounted by a style the exserted summit of which is dilated to a depressed stigmatiferous head. In each of the oppositipetalous ovarian cells is an axile placenta with ovules in two vertical series, obliquely descending, anatropous and with their raphes turned towards those of the next series.[2] The fruit is a berry, surmounted by the persistent calyx, with five polyspermous cells, the seeds of which contain a fleshy albumen and a small almost cylindrical embryo. *Leycesteria* is a shrub of the temperate regions of India, divided from the base into weak branches, hollow except at the nodes. There are inserted opposite (or rarely ternate) leaves, with petioles connate at the base, entire or dentate, often lobed on young plants. The inflorescences[3] are terminal, consisting of spikes of small biparous opposite cymes with large bracts more or less connate, the lateral wide and foliaceous.

Symphoricarpos vulgaris.

Fig. 365. Fructiferous branch.

Pentapyxis, Himalayan shrubs, differs little from *Leycesteria*; having pentamerous flowers, a deeply divided calyx, a funnel-shaped campanulate corolla, imbricate or contorted, and an ovary with five multiovulate cells, which becomes a polyspermous berry. But the

[1] Sometimes cochleate.

[2] They have only an incomplete coat.

[3] The flowers are white, with a dull purple calyx; the fruit is red, afterwards blackish.

leaves, like those of most of the true *Rubiaceæ*, are accompanied with large foliaceous stipules. The flowers are grouped in cymes occupying the axil of leaves or bracts and may resemble capitules.

In *Symphoricarpos*, the flowers are also regular (fig. 365–369), 4, 5-merous, having an imbricate bell- or funnel-shaped corolla, four or five stamens, generally short, inserted at the throat of the corolla, and an ovary with four cells surmounted by a small epigynous disk.

Symphoricarpos racemosus.

Fig. 366. Flower (½).

Fig. 367. Diagram.

Fig. 368. Antero-posterior long. sect. of flower.

Fig. 370. Fruit.

Fig. 369. Bilater long. sect. of flower.

Of the four ovarian cells, two, the anterior and posterior, are pluriovulate and become sterile, whilst the two lateral contain each only one descending ovule with dorsal raphe. In the drupaceous and 2-celled fruit (fig. 370) these uniovulate cells alone become fertile and enclose a descending albuminous seed. *Symphoricarpos* consists of North American shrubs with opposite leaves, without stipules, having flowers in spikes or axillary clusters.

Alseuosmia, a glabrous shrub of New Zealand, is exceptional in this group in that the lobes of the corolla, four or five in number, are valvate or induplicate, in the latter case with dentelate margins. The bilocular ovary is surmounted by a disk and a style the stigmatiferous extremity of which is more or less enlarged. Each of the cells contains a rather large number of ovules inserted on the partition, and becomes a berry the seeds of which are angular and have an abundant fleshy albumen and a small embryo. The leaves are alternate, entire, dentate or crenelate, and the flowers are solitary or in cymes, in the axil of the leaves, on the side or even at the extremity of the branches.

The Honeysuckles (*Lonicera*) have flowers more or less irregular chiefly in the corolla (fig. 371, 373). Of the five lobes, imbricate in the bud (fig. 372), four finally range themselves on the posterior

Lonicera Caprifolium.

Fig. 371. Flower.

Fig. 372. Diagram.

Fig. 374. Fruit ($\frac{2}{3}$).

Fig 375. Seed ($\frac{10}{1}$).

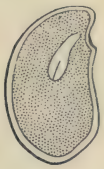

Fig. 376. Long. sect. of seed.

Fig. 373. Long. sect. of flower.

side of the flower and form a lip, whilst the anterior lip is represented only by the fifth lobe. There are five stamens in the androecium, and the ovary has three or two cells, one of which is posterior, with an indefinite number of ovules in each. The fruit is a polyspermous berry and the seeds are albuminous. They are shrubs abundant in temperate or even warm regions, particularly of the northern hemisphere. The leaves are opposite or rarely verticillate, entire or sometimes pinnatilobed. The flowers are in cymes in which the axes often become so short that the definite inflorescence may resemble a capitule. In this case the calyx often persists at the summit of the fruit, the partitions of which become pulpy or disappear. The name *Caprifolium* has been given

Lonicera ciliata.

Fig. 377. Long. sect. of geminate fruit.

Lonicera Xylosteum.

Fig. 378. Free geminate flowers.

to the section of the genus presenting these peculiarities; it comprises climbing shrubs with opposite, often connate leaves. In another section of the genus to which the name *Xylosteon* (fig. 377–379) has been given, the stems are sometimes climbing, sometimes erect; the leaves are not connate, and the flowers, grouped in pairs, have their ovaries free (fig. 378) or united to a variable extent (or even entirely) in one receptacular pouch (fig. 377, 379). The same is the case with the fruit which is not crowned with the calyx and in which the two or three pluriovulate cells remain distinct.

Lonicera alpigena.

Fig. 379. Connate geminate flowers.

Triosteum, Asiatic and American perennial herbs, has nearly the irregular flowers of the Honeysuckles, with an ovary of 2–5 cells; but in each of these there is only one descending ovule with dorsal raphe and micropyle directed inwards and upwards. The leaves are opposite, and in their axils are the flowers, which are solitary or in contracted cymes.

Linnæa borealis.

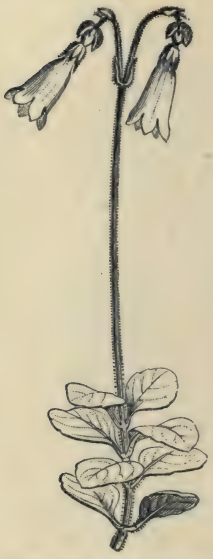

Fig. 380. Floriferous branch.

The name *Linnæa borealis* (fig. 380) has been given to a very low creeping woody plant of the northern regions of Europe, Asia and America, the flower of which is nearly that of *Lonicera*, with a corolla of five imbricate lobes, regular or somewhat irregular, and four stamens, but the three-celled ovary resembles that of *Symphoricarpos* in that the cells do not all contain the same number of ovules: two are pluriovulate, and in the third is a single descending ovule with dorsal raphe. The fruit, indehiscent, coriaceous, trilocular, contains only a single seed. In *Abelia* (fig. 381), with us only a section of the

Linnæa (Abelia) uniflora.

Fig. 381. Long. sect. of flower.

same genus, the ovary and fruit have the same organization; but the calycinal divisions (2–5) are ordinarily longer and narrower, persistent; the corolla is regular or irregular, and the inflorescence is very variable. The flowers, often in cymes, sometimes become solitary, whilst in *L. borealis*, they are generally geminate at the end of a common peduncle. They are shrubs, often elegant, of temperate India, China, Japan and N. America.

XIV. ELDER SERIES.

This series comprises two closely allied genera: *Viburnum* and *Sambucus*, from which the name (*Sambuceæ*) is derived. In the

Sambucus Ebulus.

Fig. 382. Floriferous branch (¼).

latter[1] (fig. 382–389), the ovary, inferior, is surmounted by a calyx of 3–5 divisions, often dentiform. The corolla, rotate or shortly

[1] *Sambucus* T. *Inst.* 606, t. 376.—L. *Gen.* n. 372.—J. *Gen.* 214.—Lamk. *Ill.* t. 211.—Gærtn. *Fruct.* i. 137, t. 27.—DC. *Prodr.* iv. 321.—Spach, *Suit. à Buffon*, viii. 318.—Turp. *Dict. Sc. Nat.* Atl. t. 104.—Endl. *Gen.* n. 3341.—Payer, *Organog.* 622, t. 86.—H. Bn. *Payer Fam. Nat.* 236; *Adansonia*, i. 358, t. 12.—B. H. *Gen.* ii. 3, n. 2.—Hook. *Fl. Ind.* iii. 2.—*Phyteuma* Lour. *Fl. Cochinch.* 172 (not L.).—*Tripetelus* Lindl. *Mitch. Thr. Exped.* ii. 14.

campanulate, has 3–5 valvate lobes, most frequently imbricate in a variable manner (fig. 384, 385), and sometimes reflexed at anthesis. The stamens, inserted near the bottom of the corolla, are five in

Sambucus Ebulus.

Fig. 383. Flower (♀).

Fig. 386. Long. sect. of flower.

number, alternate with the lobes, each formed of a filament[1] and a bilocular introrse anther dehiscing by two longitudinal clefts.[2] The summit of the inferior ovary is surmounted by a disk often reduced

Sambucus canadensis.

Fig. 384. Diagram (flower with 5-celled ovary).

Fig. 385. Diagram (flower with 3-celled ovary[3]).

to a thin glandular bed; it is produced in a conical form and divided above into 3–5 short stigmatiferous lobes. Corresponding to these and to the lobes of the corolla (fig. 384) are as many cells each containing a descending ovule, inserted near the summit, with micropyle interior and superior, while the raphe is dorsal.[4] The fruit is a drupe with 3–5 putamens more or less thick, enclosing each a descending seed, the fleshy albumen of which surrounds an embryo

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[1] Sometimes rugose or slightly embossed.

[2] The pollen according to H. Mohl (*Ann. Sc. Nat.* ser. 2, iii. 324), is "ovoid, three-fold; in water, spherical having three bands, with three papillæ (*Viburnum, Sambucus*)."

[3] More accurately the petals ought to be united in figs. 367, 384, and 385.

[4] It may ultimately deviate so that the raphe may become lateral. The coat is single.

almost as long as itself, with cylindro-conical radical and oval inferior cotyledons. The Elders are trees, shrubs or even perennial herbs mostly of the temperate regions of both worlds. The leaves are opposite, imparipinnate, with dentate or laciniate folioles, often accompanied with stipels. At the base of the leaves themselves are foliaceous stipules or glandular bodies in place of them. The flowers[1]

Sambucus nigra.

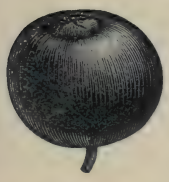

Fig. 387. Fruit (½).

Fig. 389. Seed (5/1).

Fig. 388. Long. sect. of fruit.

are in clusters or corymbs of cymes which may become uniparous, especially near the extremity;[2] they are articulate and accompanied with bracteoles. About ten[3] species are enumerated.

Viburnum closely resembles the Elders. The lobes of the calyx are more or less developed, sometimes quincuncial; the corolla is variable in form, imbricate; and the ovary is 1–3-celled, in most cases only one being fertile and uniovulate. The fruit is drupaceous, often little fleshy, mostly monospermous. The albumen of the seed is sometimes ruminate. They are trees and shrubs of the temperate regions of the northern hemisphere; they are also found in the Andean regions of both Americas, in the Antilles and Madagascar. The leaves are opposite or verticillate, simple, with small or no stipules. The inflorescence and other parts of their organization are ordinarily the same as in the Elders.

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[1] Small or moderate, white, yellowish or pink, often odorous.

[2] There also they may become unisexual.

[3] Reichb. *Icon. Fl. Germ.* t. 729–731.—Webb, *Phyt. Canar.* t. 78 *bis*.—A. Gray, *Man.* (ed. 2) 166.—C. Gay, *Fl. Chil.* iii. 174.—Benth. *Fl. Austral.* iii. 398.—F. Muell. *Pl. Vict.* t. 29.—Hook. f. and Thoms. *Journ. Linn. Soc.* ii. 179.—Kurz, *For. Fl. Brit. Burm.* ii. 3.—Boiss. *Fl. Or.* iii. 2.—Stev. *Ann. Sc. Nat.* ser. 3, xii. 375.—Willk. et Lang. *Prodr. Fl. Hisp.* ii. 329.—Gren. et Godr. *Fl. de Fr.* ii. 6.—Walp. *Rep.* ii. 453; *Ann.* ii. 733.

XV.? ADOXA SERIES.

Adoxa[1] (fig. 390–395), referred to different families[2] and doubtfully belonging to this, but that it is difficult to separate it from *Viburnum*, has hermaphrodite and heteromerous flowers. The receptacle has the form of a hemispherical cup in which is imbedded

Adoxa Moschatellina.

Fig. 391. Inflorescence, after the fall of the corollas.

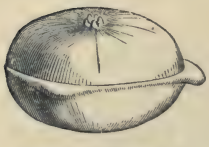

Fig. 392. Fruit (4).

Fig. 390. Floriferous branch.

Fig. 394. Putamen.

Fig. 395. Long. sect. of putamen.

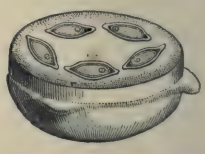

Fig. 393. Long. sect. of fruit.

the lower part of the gynæcium, whilst the margin supports the perianth. The latter consists of a calyx with two or three unequal divisions, and a gamopetalous rotate corolla with four, five or six imbricate lobes, often a little unequal. At the throat of the corolla are inserted the stamens, equal in number and alternating with the divisions, but presenting this peculiarity, that each has a connective very deeply divided into two subulate and erect branches, each supporting a subpeltate anther-cell, dehiscing above by a longitudinal cleft.[4] The ovary, semi-inferior, with four to six oppositipetalous cells, is surmounted by a like number of stylary branches with obtuse

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[1] L. *Gen.* n. 501.—J. *Gen.* 309.—Lamk. *Ill.* t. 320.—Gærtn. *Fruct.* ii. 141, t. 112.—DC. *Prodr.* iv. 251.—Endl. *Gen.* n. 4550.—Payer, *Organog.* 413, t. 86.—B. H. *Gen.* ii. 2, n. 1.—H. Bn. *Bull. Soc. Linn. Par.* 167.—Hook. *Fl. Ind.* iii. 1.—*Moschatellina* T. *Inst.* 156, t. 68.—*Moscatella* Cord.—Adans. *Fam. des Plant.* ii. 243.

[2] Particularly to the *Araliaceæ*.

[3] Greenish or a yellowish white.

[4] Subextrorse. The dry seeds of the pollen bear three longitudinal furrows.

or slightly enlarged stigmatiferous extremity. In the internal angle of each cell is inserted a descending anatropous ovule,[1] the micropyle of which is primarily directed upwards and inwards.[2] The fruit, around which persist the little developed sepals, is a drupe the putamens of which, four to six in number, enclose each a descending compressed seed with a hard albumen near the summit of which is a small embryo with superior radicle. The only species[3] known is a small perennial herb with musk-like odour, a thin fleshy stock creeping under the soil and bearing alternate scales, then 3–5-foliolate or 2–3-ternatisect leaves, which in spring expand in the air and have a long petiole, dilated below to a fleshy sheath. The flowers terminate a small axis bearing two opposite, 3-foliolate-lobed leaves, and are united in a sort of small few-flowered capitule (?), the terminal flower of which is tetramerous, more rarely pentamerous, and the lateral flowers pentamerous, more rarely hexamerous. This plant inhabits the cold and temperate countries of the northern hemisphere.

B. de Jussieu, in 1759, admitted an Order *Rubiaceæ*[4] in which he included *Lippia*. Adanson gave to the same genus the name of *Aparinæ*.[5] A. L. de Jussieu[6] resumed the name of *Rubiaceæ* for an Order in which he placed *Bellonia*. In 1829, Ach. Richard presented to the Academy of Sciences a Memoir on the family of the *Rubiaceæ* which was not published till later,[7] when A. P. de Candolle had given a monograph of this family in the *Prodromus*.[8] Being considered a difficult study, it remained for a long time without comprehensive treatment. Endlicher[9] restricted himself to reproducing, with some very small additions, the researches of his two predecessors. He admitted thirteen tribes of *Rubiaceæ* with three hundred and twenty genera, exclusive of a score of doubtful ones. Lindley divided the *Rubiaceæ* into two Orders, *Cinchoniaceæ*[10] and *Galiaceæ*,[11] interposing *Caprifoliaceæ*.[12] The latter, in our opinion,[13]

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[1] Sometimes two, it is said.

[2] There is only one envelope.

[3] *A. Moschatellina* L. *Spec.* 257.—Sow. *Engl. Bot.* t. 453.—DC. *Fl. Fr.* iv. 382.—Gren. et Godr. *Fl. de Fr.* ii. 5.—*Moschatellina tetragona* Mœnch. *Meth.* 478.

[4] *A. L. Juss. Gen. Pl.* lxv.

[5] *Fam. des Pl.* ii. (1763) 140, Fam. 19.

[6] *Gen.* 196, Ord. 2; *Ann. Mus.* x. 313 (1807); *Mém. Mus.* vi. 365 (1820); *Dict. Sc. Nat.* xlvi. 385.

[7] *Mém. Soc. Hist. Nat. Par.* v. 81 (1830).

[8] iv. 341, Ord. 98 (1830).

[9] *Gen.* (1836–1840) 520, Ord. 127.

[10] *Veg. Kingd.* (1846) 761, Ord. 293.—*Lygodysodeaceæ* Bartl. *Ord. Nat.* 207.

[11] *Introd.* (ed. 2) 249; *Veg. Kingd.* 768, Ord. 295.

[12] *Veg. Kingd.* 766, Ord. 294.

[13] *Bull. Soc. Linn. Par.* 204 (1879).

belong to the same family as the *Rubiaceæ*. J. D. HOOKER, however, has kept them separate in the great and comprehensive work on the family of the *Rubiaceæ*[1] given some years since. It there comprises 340 genera distributed in twenty-five tribes, classified in three series according as the ovules are solitary, geminate or indefinite in number. We have reduced the number of tribes or series to fifteen, comprising 203 genera[2] and about 4500 species:

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[1] *Gen.* ii. (1873) 7, 1226, Ord. 84.

[2] Omitting doubtful genera, imperfectly known, the number of which is considerable. These are:

1. *Acrodryon* (SPRENG. *Syst.* i. 365). A genus proposed for *Cephalanthus orientalis, angustifolius* and *stellatus* LOUR. (DC. *Prodr.* iv. 539, n. 7–9). (*Naucleæ* or *Morindæ ?*)

2. *Aidia* (LOUR. *Fl. Coch.* 143). Enumerated by DE CANDOLLE among the *genera* allied to the *Lonicereæ* (*Prodr.* iv. 340). Probably a *Fagræa.*

3. *Antherura* (LOUR. *Fl. Coch.* 143). Often referred to *Psychotria*, differing from it (DC. *Prodr.* iv. 503) by its rotate corolla, anthers with reflexed caudate summit and tubular style (*Apocyneæ ?*).

4. *Aphænandra* (MIQ. *Fl. Ind.-Bat.* ii. 341). "A genus still of doubtful affinity (whether allied to *Menestoria* or *Mussaenda* ?)."

5. *Bamboga* (*Mangoya* BLANCO, *Fl. Filip.* 140, ex ENDL. *Gen.* 1394). (*Naucleæ ? ?*)

6. *Benzonia* (SCHUM. *Beskr.* 113.—HIERN, *Fl. Trop. Afr.* iii. 246). A shrub of Guinea, with small pentamerous flowers. (*Canthium ? ?*)

7. *Berghesia* (NEES. *Linnæa*, xx. 701). A Mexican plant, referred to the *Cinchoneæ*, with tetramerous flowers, cells of capsular fruit said to be monospermous. (*Bouvardia ? Uragoga ?*)

8. *Coptophyllum* (KORTH. *Ned. Kruidk. Arch.* ii. 161;—MIQ. *Fl. Ind.-Bat.* ii. 175). A genus doubtfully referred (B. H. *Gen.* ii. 68, n. 110) to *Mussaendeæ.*

9. *Delpechia* (MONTROUS. *Mém. Acad. Sc. Lyon*, x. 221). Shrubs of New Caledonia, with 4–7-merous flowers, 1-ovulate ovarian cells, referred to the *Coffeeæ.* (*Guettardæ ? Uragoga ?*)

10. *Douarrea* (MONTROUS. *Mém. Acad. Sc. Lyon*, x. 222). New-Caledonian shrubs, with 5-merous flowers and drupe with monospermous cells. (*Uragoga ?*)

11. *Figuieria* (MONTROUS. *Mém. Acad. Sc. Lyon*, x. 220). "A climbing shrub with terminal cymes, 4–5-merous flowers, four 1-ovulate cells." (Apparently *Olostyla* DC.)

12. *Gurdeniopsis* (MIQ. *Ann. Mus. Lugd.-Bat.* iv. 250, 262). A genus of Sumatra and Borneo, doubtfully referred (B. H. *Gen.* ii. 115, n. 243) to the *Ixoreæ.* The corolla said to have 5 imbricate lobes and the 2 ovarian cells to be 1-ovulate.

13. *Lepipogon* (BERTOL. *Mem. Acad. Bologn.* iv. [1853] 539, t. 21). A shrub of south-eastern Africa doubtfully referred to the *Rubiaceæ* (HIERN, *Fl. Trop. Afr.* iii. 247). The ovary is described as adherent; but the leaves appear not opposite. (*Cordieæ ?*)

14. *Platymerium* (BARTL. ex DC. *Prodr.* iv. 390). "Closely allied to *Psilobium*" (DC.). A shrub of the Philippines, corolla said to be contorted. (*Ixora ?*)

15. *Pogonanthus* (MONTROUS. *Mém. Acad. Sc. Lyon*, x. 225). A shrub of New Caledonia, doubtfully referred to the *Opercularieæ.* Flowers capitate; corolla valvate. (*Uragoga ?*)

16. *Polyozus* (LOUR. *Fl. Coch.* 74). Two species from Cochin China, one of which (*P. bipinnata*) is perhaps a *Cunoniea* or a *Meliacea. P. lanceolata* has been compared to *Pavetta* (*?*).

17. *Psilobium* (JACK, *Mal. Misc.* ii. n. vii. 84.—WALL. *Roxb. Fl. Ind.* ii. 320). A doubtful genus of *Mussaendeæ* (B. H. *Gen.* ii. 75, n. 132). Corolla "valvate."

18. *Solenocera* (ZIPP.). "A plant rather from its inferior calyx to be referred to the *Loganiaceæ.*" (B. H. *Gen.* ii. 29.)

19. *Stigmanthus* (LOUR. *Fl. Coch.* 146). A shrub with polyspermous fruit. (*Genipa ? ?*)

20. *Sulipa* (BLANCO, *Fl. Filip.* 279). A *Cyrtandracea* ? (B. H. *Gen.* ii. 29).

21. *Votomita* (AUBL. *Guian.* i. 90, t. 35). Flowers 4-androus. Cells said to be 1-spermous. (*Ixora ?* Apocynea ?)

22. *Zuccarinia* (BL. *Bijdr.* 1006 [not SPRENG.]; —MIQ. *Fl. Ind.-Bat.* ii. 197;—B. H. *Gen.* ii. 97, n. 189). A Javan tree, doubtfully referred to the *Gardenieæ*, having polyspermous fruit with common involucrate receptacle. Perhaps a neighbour of *Lucineæ ?* (See page 317, note.)

23. *Egeria* and *Meretricia* NÉR. (ex GAUDICH. *Freyc. Voy. Bot.* 28, names only) ? ?

I. RUBIEÆ.[1]—Herbaceous plants the leaves of which, with the stipules ordinarily conformed to them, form verticils (*Stellatæ*[2]). Flowers small, generally asepalous, with valvate corolla, uniovulate cells (generally 2). Ovule ascending with micropyle exterior and inferior. Fruit dicoccous, dry or fleshy. Seed with horny albumen and curved embryo; radical inferior.—2 genera.

II. SPERMACOCEÆ.[3]—Herbaceous, rarely frutescent, plants, rarely glabrous, with leaves generally opposite, stipules small, often connate, setiform. Flowers small, in cymes often capitate; corolla valvate. Ovules solitary, ascending. Fruit with (most frequently) dehiscing or indehiscing cocci. Seeds with fleshy and often horny albumen; embryo straight or curved with inferior radicle.—9 genera.

III. ANTHROSPERMEÆ.[4]—Shrubby or climbing, rarely herbaceous (mostly fetid) plants with leaves often opposite, stipules unlike the leaves. Flowers hermaphrodite or very often unisexual, or polygamo-diœcious, with valvate corolla; stamens (often dimorphous) ordinarily exserted, with capillary filaments, anthers pendent (in the male flower), versatile, elongate. Ovary cells 1–5 with one ascending ovule. Fruit with 1–5 cocci or putamens often separating from each other and from the exocarp. Seed albuminous; embryo with flat cotyledons and inferior radicle.—18 genera.

IV. COFFEEÆ.[5]—Woody plants with opposite leaves, smaller stipules, connate in interfoliary pairs, generally entire. Corolla twisted.[6] Ovary generally 2-celled. Ovules solitary,[7] ascending. Fruit fleshy or coriaceous, indehiscent. Seeds generally plano-convex, with horny more rarely fleshy albumen; embryo more or less curved, with flat, more or less foliaceous cotyledons and inferior radicle.—5 genera.

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[1] *Aparineæ* LINK.—*Galeæ* K. *Nov. Gen. et Sp.* iii. 335 (1818).—*Galiaceæ* LINDL. *Galieæ* TURP. *Dict.* Atl.—B. H. *Gen.* ii. 28, Trib. 25.

[2] RAY, *Synops.* 223 (1690).—CHAM. et SCHLC. *Linnæa*, iii. (1828) 220.—ENDL. *Gen.* 522, Trib. 2.—*Asperuleæ* RICH. *Rub.* 26, 46, Trib. 1.

[3] K. *Nov. Gen. et Sp.* iii. 341.—RICH. *Rub.* 67 (part).—B. H. *Gen.* ii. 27, Trib. 24.—*Euspermacoceæ* DC. *Prodr.* iv. 540.

[4] RICH. *Rub.* 56, Trib. 2.—CHAM. et SCHLCHTL, *Linnæa*, iii. 309.—DC. *Prodr.* iv. 578, Trib. 11.—ENDL. *Gen.* 524, Trib. 3.—B. H. *Gen.* ii. 26, Trib. 23.—*Pœderieæ* DC. *Prodr.* iv. 470, Trib. 8.—ENDL. *Gen.* 538, Trib. 6.—B. H. *Gen.* ii. 25, Trib. 22.—*Lygodysodeaceæ* BARTL. *loc. cit.*—*Operculariceæ* J. *Ann. Mus.* iv. 418; x. 328.—RICH. *Rub.* 62.—DC. *Prodr.* iv. 614.—ENDL. *Gen.* 521, Trib. 1.

[5] *Coffeaceæ* RICH. *Rub.* 84, Trib. 5 (part).—*Coffeeæ* DC. *Prodr.* iv. 472 (part).—*Ixoreæ* B. H. *Gen.* ii. 22, Trib. 18 (part).

[6] Except in *Strumpfia*, where it is slightly imbricate. But the genus is abnormal in whatever division it is placed.

[7] The number is raised to 2, 3 or becomes indefinite in some sections of the genus *Ixora*, which we could not however separate generically from *Ixora* a type with uniovulate cells. (See *Adansonia*, xii. 215.)

V. URAGOGEÆ.[1]—Woody plants[2] with stipules unlike the leaves. Corolla valvate. Ovarian cells uniovulate; ovule ascending, with micropyle exterior and inferior. Ovary inferior, often with two cells, complete or incomplete, or without partition,[3] exceptionally semi-inferior or nearly superior.[4] Fruit ordinarily with two putamens. Seed with horny albumen, straight or curved embryo, semi-cylindrical or flat cotyledons and inferior radicle.—12 genera.

VI. MORINDEÆ.[5]—Woody, often climbing, rarely herbaceous plants with small stipules. Corolla valvate.[6] Ovaries ordinarily 2-celled, free or connate. Ovules ascending, with exterior and inferior micropyle, solitary in each cell, or more rarely geminate, with a false partition, complete or incomplete, between the two ovules dividing the cell into two uniovulate cellules. Fruit drupaceous, rarely membranous and incompletely dehiscent.—9 genera.

VII. CHIOCOCCEÆ.[7]—Woody or more rarely herbaceous plants, with small stipules. Corolla valvate, imbricate or contorted. Ovarian cells uniovulate. Ovule descending,[8] with dorsal raphe, micropyle interior and superior. Seeds generally descending, with or without albumen; embryo with superior or more rarely inferior radicle.[9]—25 genera.

VIII. GENIPEÆ.[10]—Woody plants with stipules smaller than the leaves. Corolla contorted, valvate or imbricate. Ovules numerous in each cell.[11] Fruit fleshy, often polyspermous, rarely dehiscing at the summit in an incomplete manner, or opening irregularly. Seeds albuminous.—48 genera.

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[1] *Psychotriaceæ* CHAM. et SCHLCHTL.—*Coffeeæ* DC. (part).—*Psychotrieæ* ENDL. *Gen.* 530, Trib. 5 (part).—B. H. *Gen.* ii. 24, Trib. 21.—*Cephælideæ* DC. *Prodr.* iv. 532.

[2] Except some *Uragogas* which are herbaceous.

[3] A frequent (but not constant) character of the *Coussareæ*. (B. H. *Gen.* ii. 24, Trib. 20.)

[4] As in the *Gærtnereæ* (*Gærtnera*, *Pagamea*), frequently referred to the *Loganiaceæ*, differing from *Uragoga*, from which they cannot be separated, only in the smaller cavity of the floral receptacle.

[5] *Guettardaceæ* K. *Nov. Gen. et Spec.* iii. 419 (part).—DC. *Prodr.* iv. 446 (Subtrib. *Morindeæ*). B. H. *Gen.* ii. 23, Trib. 19.—*Cruckshanksieæ* B. H. *loc. cit.* 20, Trib. 11.—*Retiniphylleæ* B. H. *loc. cit.* 20, Trib. 3.

[6] Except in *Retiniphyllum* where it is contorted and which has more than two ovarian cells.

[7] B. H. *Gen.* ii. 21, Trib. 15.—*Guettardaceæ* RICH. *Rub.* 120, Trib. 6.—*Guettardeæ* DC. *Prodr.* iv. 450 (part).—B. H. *Gen.* ii. 20, Trib. 13.—*Knoxieæ* B. H. *loc. cit.* 21, Trib. 14.—*Alberteæ* B. H. *loc. cit.* 22, Trib. 16.—*Vanguericeæ* B. H. *loc. cit.* 22, Trib. 17.

[8] Except in some species of *Canthium*.

[9] In *Prismatomeris*, *Mitchella* and *Damnacanthus*, in which the micropyle is not so high as in other genera of the series.

[10] *Gardenieæ* RICH. *Rub.* 159, Trib. 10.—ENDL. *Gen.* 557, Trib. 13.—B. H. *Gen.* ii. 17, Trib. 10.—*Gardeniaceæ* DC. *Prodr.* iv. 367, Trib. 2.—*Cordiereæ* RICH. *Rub.* 142, Trib. 7.—ENDL. *Gen.* 545, Trib. 8.—*Hameliaceæ* RICH. *Rub.* 146, Trib. 8.—*Hamelieæ* DC. *Prodr.* iv. 438, Trib. 5.—ENDL. *Gen.* 545, Trib. 9.—B. H. *Gen.* ii. 17, Trib. 8.—*Isertieæ* RICH. *Rub.* 155, Trib. 9.—ENDL. *Gen.* 547, Trib. 10.—*Catesbeæ* B. H. *Gen.* ii. 17, Trib. 9.—*Mussaendeæ* B. H. *Gen.* ii. 15, Trib. 7.

[11] Reduced to one or two in some sections of the genus *Hypobathrum* (see H. BN. *Adansonia*, xii. 203-205).

IX. OLDENLANDIEÆ.[1]—Herbaceous, rarely frutescent, plants, with small stipules, entire or divided at the margin, or with none. Corollary valvate. Ovules numerous,[2] inserted on a placenta ordinarily fixed by a short foot at a variable height or at the base of the internal angle. Fruit inferior or rarely semi-inferior, or free,[3] generally capsular, more rarely indehiscent or fleshy.[4] Seeds small, angular, peltate, rarely winged.—15 genera.

X. PORTLANDIEÆ.[5]—Woody plants. Stipules smaller than the leaves. Corolla valvate, imbricate or contorted. Fruit capsular, polyspermous. Seeds generally wingless.[6]—17 genera.

XI. CINCHONEÆ.[7]—Woody plants. Stipules smaller than the leaves. Corolla valvate, imbricate or contorted. Fruit capsular, inferior or rarely superior.[8]—Seeds winged or appendiculate.—32 genera.

XII. DIERVILLEÆ.[9]—Woody plants. Leaves opposite, without stipules. Corolla imbricate. Fruit capsular. Seeds winged.—1 genus.

XIII. LONICEREÆ.[10]—Woody, rarely herbaceous plants,[11] without stipules or rarely with large interfoliar stipules.[12] Corolla regular or irregular. Ovarian cells 1- or many-seeded. Fruit fleshy.—7 genera.

XIV. SAMBUCEÆ.[13]—Woody or rarely herbaceous plants. Leaves opposite or verticillate, simple or imparipinnate; stipules often glanduliform or large, foliaceous, or none. Corolla imbricate or valvate, rotate or with a short tube. Fruit fleshy.—2 genera.

XV. ? ADOXEÆ.[14]—Perennial herbaceous plants, with alternate ternatisect leaves. Corolla rotate, imbricate. Stamens unsheathed. Ovules generally solitary and descending. Fruit fleshy.—1 genus.

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[1] *Hedyotideæ* CHAM. et SCHLCHTL, *Linnæa*, iv. 150.—DC. *Prodr.* iv. 401, Trib. 3.—B. H. *Gen.* 13, Trib. 6.—*Rondeletieæ* B. H. *Gen.* ii. Trib. 5 (part).

[2] Reduced to a few or even to one in several species of *Oldenlandia*.

[3] Particularly in *Synaptantha* and *Polypremum*; the latter referred by some authors to the *Loganiaceæ*.

[4] In *Coccocypselum*.

[5] *Condamineeæ* B. H. *Gen.* ii. 12, Trib. 4 (*Condamineæ*)—*Rondeletieæ* B. H. (part).

[6] Except in some species of *Portlandia*, which have a winglike seminal margin.

[7] RICH. *Rub.* 185, Trib. 11.—*Cinchonaceæ* DC. *Prodr.* iv. 343 (part).—ENDL. *Gen.* 553, Trib. 12.—B. H. *Gen.* ii. 12, Trib. 2.—*Henriqueziæ* B. H. *Gen.* ii. 12, Trib. 3.—*Naucleeæ* DC. *Prodr.* iv. 243 (*Cinchonaceæ* Subtrib.).—ENDL. *Gen.* 557.—B. H. *Gen.* ii. 9, Trib. 1.

[8] In *Platycarpum*.

[9] H. BN. *Bull. Soc. Linn. Par.* 203 (1879).

[10] ENDL. *Gen.* 366, Ord. 128 (part).—B. H. *Gen.* ii. 4 (*Caprifoliaceæ* Trib. 2).—*Caprifolia* J. *Gen.* 210 (part).—*Caprifoliaceæ* A. RICH. *Dict. Class.* iii. 172.—DC. *Prodr.* iv. 321, Ord. 97.—LINDL. *Introd.* (ed. 2) 247; *Veg. Kingd.* (1846) 766, Ord. 294 (part).—H. BN. *Adansonia*, i. 353, t. 12.

[11] *Triosteum* consists of perennial plants.

[12] In *Pentapyxis*.

[13] K. *H. B. K. Nov. Gen. et Spec.* iii. 424.—DC. *Prodr.* iv. 321, Trib. 1.—ENDL. *Gen.* 569, Subord. 2.—B. H. *Gen.* ii. 2, Trib. 1 (part).—*Viburneæ* BARTL. *Ord. Nat.* 214.

[14] PAYER, *Organog.* 413 (Ord.).—J. G. AG. *Theor. Syst. Plant.* 77.

From the above it may be seen that very few of the characters are absolutely constant; but that several are so frequent and are wanting only in cases so exceptional that they impress upon the family a very decided mark. These are in particular: the opposition of the entire leaves,[1] the presence of stipules;[2] the gamopetalousness of the corolla,[3] its regularity;[4] the insertion of the stamens upon it;[5] the inferior ovary[6] and the presence of an albumen in the seeds.[7] Except in the *Rubieæ*, the woody consistence[8] of the stem is also ordinarily the rule.

Geographical distribution.—Of all the genera of *Rubiaceæ* we have admitted, twenty-two only are found in both worlds. America possesses exclusively seventy-eight; the old world a hundred and twelve, about half the total. Many of the genera, it is true, are monotypes, particularly in tropical Africa and Madagascar. The *Rubieæ* are often plants of temperate and cold countries. *Rubia* (*Galium*) *Aparine* is found throughout Europe, in Asia, in Africa and in America, from the extreme north to Tierra del Fuego. Many of the annual *Galiums* are found everywhere in the crops. *Linnæa borealis* grows in the north of Europe, Asia and America. Many *Caprifolieæ* are plants of the cold regions of the northern hemisphere. The Black Elder (*Sambucus nigra*) and Danewort (*S. Ebulus*) are found as far as Sweden. *Adoxa* is very widely spread throughout the northern hemisphere. With the exception of *Mitchella*, which ascends to the

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[1] Alternate in *Didymochlamys* and *Adoxa*; dentate or crenelate in some rare species of *Uragoga*, *Carlemannia* and *Silvianthus*, *Neurocalyx*, *Heterophyllæa*; lobed in *Pentagonia*; sinuate, it is said, in *Sickingia*; often divided or compound in the *Lonicereæ*, *Sambuceæ* and in *Adoxa*.

[2] Generally wanting in the old Order of *Caprifoliaceæ* (except in *Pentapyxis* and many *Sambuceæ*), and in several *Hedyotideæ* (in their mode of development and their signification, see Lanessan. *Compte Rend. Ass. Franç.* v. 465, t. 5). There is also a long discussion by Lindley on the value of the stipules of the *Galiaceæ* in the *Vegetable Kingdom* (769).

[3] Polypetalous in several *Morindeæ*, *Aulacodiscus*, *Synaptantha*, &c.

[4] Irregular in *Platycarpum*, *Capirona*, *Ferdinandusa*, *Dichilanthe*, and several *Lonicereæ* (*Lonicera*, *Triosteum*, *Linnæa*).

[5] Sometimes inserted on the receptacle, particularly in the dialypetalous flowers.

[6] Partly free in the *Gærtnereæ* *Platycarpum*, *Synaptantha*, *Polypremum*, *Rhachicallis*, *Mitreola*, some *Oldenlandias*, &c.

[7] Nil or thin in the true *Guettardeæ*.

[8] Herbaceous also in *Polypremum*, *Synaptantha*, many *Oldenlandics*, several *Uragogas*, a considerable number of *Hedyotideæ* and *Anthospermeæ*. Besides Madder and the Cinchonas, several woody *Rubiaceæ* have been anatomically studied: *Pæderia* (H. Mohl, *Ueb. den Bau der Rank.-und Schlingpfl.* [1827] § 75), *Sabicea* (Crueg. *Bot. Zeit.* [1851] 470). Mention has often been made of the singular organization of the tuberous stems of *Hydnophytum* and *Myrmecodia*, the enlargements of which are hollowed into cavities inhabited by ants, &c. Several *Rubiaceæ* are epiphytal or (?) parasitic.

north of America and Japan, the other series of *Rubiaceæ* are plants of warm countries and three-fourths of them are tropical. The *Cinchonas*, though belonging to the zone in America extending from 10° N. to 22° S. rise on the mountains so as to live frequently in a temperate atmosphere. The zone of altitude, formerly fixed at "from 5000 to 8000 feet above the sea-level," has, by more recent observations, been extended to from 2600 to 11,000 feet, which affords an explanation of the fact of their having been introduced from the Andine regions to which they were long confined into so many other countries, as Java, India, the Mascarene Isles, &c. Some genera, as *Spermacoce*, *Oldenlandia*, are represented by weeds in all warm countries of the globe. Many others are extremely limited in geographical area. Half the *Anthospermeæ* are found only at the Cape and in countries bordering upon it. *Otiophora*, *Hymenocnemis*, *Leiochilus*, *Nematostylis*, *Chapeliera*, *Canephora*, have been seen only in Madagascar. The diandrous types, as *Carlemannia* and *Silvianthus*, are confined to Bengal. There are also Mexican genera that have been seen only in a single very limited spot. On the other hand *Morindas* have been found in tropical western Africa, Madagascar, tropical Asia and Oceania and South America. *Pœderia* is now known to extend from tropical Africa to the east of southern America, as also various sections of *Genipa*, *Sabicea*, *Lasianthus* and the great genera *Uragoga*, *Ixora* and *Ourouparia*.

Affinities.—Authors who admit the family *Loganiaceæ* think that these differ essentially from the *Rubiaceæ* only in the ovary being superior instead of inferior. We have ranged the group *Gærtnereæ* in the series *Uragogeæ* notwithstanding the position of the ovary. The *Valerianaceæ* are very analogous to certain *Caprifoliæ;* they have the flower except the number of stamens, which is less than that of the divisions of the corolla only in *Linnæa*, and the presence of a tuft at the top of the fruit. *Adoxa* has been placed, I know not why, among the *Araliæ*. Wherever placed, it is true, it forms a very abnormal type by some of its characters. There is a great resemblance between some *Rubiaceæ* and the *Compositæ*, although the inflorescence of the former is never a true capitule, but only a collection of contracted cymes; this arrangement may, indeed, be met with among the *Synantheræ*. The latter have only one fertile carpel; but such is the case here and there among the *Rubiaceæ*, even in a *Genipa*. The *Cornaceæ* appear to us the group which approaches nearest to the

Rubiaceæ, especially when the former have opposite leaves and mixed but capituliform inflorescences. They have no stipules, it is true, but these are also wanting in some *Rubiaceæ*.[1] We do not present the polypetalous or gamopetalous character as absolutely differential, because we now know that there are *Rubiaceæ* really polypetalous, particularly in the series *Morindeæ*. Some *Loranthaceæ* of the group *Olaceæ*, in which are found inferior ovaries, gamopetalous corollas and descending ovules with dorsal raphe, thereby nearly approach the *Cornaceæ* and some *Rubiaceæ;* but the latter have not normally, except in a single doubtful case, oppositipetalous stamens.

Uses.[2]—This family, very rich in useful products, is one of those which best demonstrate the groundlessness of the theory that the properties of plants exactly accord with their characters. It includes, in fact, at once powerful tonic-astringents and remedies daily used as evacuants. The most remarkable of the latter is the true Ipecacuanha, the most commonly used being the curled variety. Two kinds are distinguished in practice: the smaller curled Ip. which is the root of *Uragoga Ipecacuanha*[3] (fig. 262-265), a Brazilian species; and the larger curled Ip. from a Columbian species not described, very near to or only a variety of the former.[4] Although employed in Europe chiefly as emetics, they were introduced as specifics against dysenteric affections. Less active than the above, the striated Ip. is also of two

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[1] By their inferior ovary and gamosepalous corolla, many *Vaccinieæ* approach the polyspermous *Rubiaceæ*. Their affinity to the *Dipsaceæ* follows equally from that to the *Valerianaceæ* and *Compositæ*.

[2] Endl. *Enchirid.* 276.—Lindl. *Veg. Kingd.* (1846) 762, 767, 770.—Lindl. *Fl. Med.* 405.—Guib. *Drog. Simpl.* (ed. 7) iii. 79.—Rosenth. *Synops. Plant. Diaphor.* 319, 1119.

[3] See p. 280, not. 1, 2. *Cephælis Ipecacuanha* Rich. *Diss. Ipec.* 21, t. 1; *Bull. Fac. Méd.* (1818).—Mart. *Mat. Med. Bras.* i. 4, t. 1.—A. S.-H. *Pl. Us. d. Bras.* t. 6.—DC. *Prodr.* iv. 535, n. 25.—Guib. *loc. cit.* 85, fig. 599 (empr. à Moquin).—Pereira, *Elem. Mat. Med.* (ed. 4) ii. p. ii. 55.—Wedd. *Ann. Sc. Nat.* ser. 3, xi. 193.—Lindl. *Fl. Med.* 442.—Berg et Schm. *Darst. Off. Gew.* t. 15 *c.*—Flück. et Hanb. *Pharmacogr.* 331.—*C. emetica* Pers. *Enchirid.* i. 203 (part).—*Callicocca Ipecacuanha* Brot. *Trans. Linn. Soc.* vi. (1801) 137, t 11.—*I. officinalis* Arrud. *Diss.* (1810).—*Ipecacuanha* Pis. *Bras.* 231. — *Ipecacoanha* Marcgr. *Bras.* 17.

[4] Which we propose, for greater clearness, to call provisionally *U. granatensis*.

sorts: the larger is the product of *Uragoga emetica*,[1] a Columbian species, not rich in emetine; and the smaller,[2] the true source of which is unknown. The undulated varieties are furnished, one by a Columbian shrub, *U. undata*,[3] the other by an herbaceous plant of Brazil, *Richardia scabra*.[4] Many other *Rubiaceæ*, belonging to very different series, are equally vomitive. The powdered fruit of *Genipa dumetorum* is employed for this purpose in India and Nubia. *Quinquina Piton*, the bark of *Exostema floribundum*, also produces emetics; in India, the root of *Pœderia fœtida*[5] (fig. 248–250). The roots of various *Chiococcas*, as *C. racemosa*[6] (fig. 252–285), *densifolia*,[7] *anguifuga*,[8] are mentioned as very vomitive. These roots, as the name of the last indicates, have a great reputation in America as specifics against the bite of venomous serpents. They are called roots of *Cainça* or *Cahinca*. The infusion of the bark is also said to be a violent drastic. In the East Indies the same qualities are attributed to *Genipa campanulata*.[9] In Brazil the root of *Manettia cordifolia*,[10] probably from its violent purging, is considered a cure for serous evacuations; it is also, like the Ipecacuanhas, an esteemed antidysenteric. Several species of *Spermacoce* are equally employed by the Brazilians as emeto-cathartics, particularly *S. Poaya*[11] (fig. 235,

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[1] *Psychotria emetica* Mut. ex L. f. *Suppl.* 144 (part).—H. B. K. *Pl. Æquin.* ii. 142, t. 126; *Nov. Gen. et Sp.* iii. 355.—DC. *Prodr.* iv. 504, n. 2.—A. Rich. *Diss. Ipec.* t. 2.—Guib. *Drog. Simpl.* (ed. 7) iii. 91, fig. 602, 603.—*Cephælis emetica* Pers. (part).—*Ipecacuanha noir* Rich. *Dict. Sc. Méd.* xxvi. 4, c. icon.

[2] Guib. *loc. cit.* 91.—*I. des mines d'or* Pellet. *Journ. Pharm.* vi. 265.

[3] Jacq. *Hort. Schœnbr.* iii. 5, t. 260; *Fragm.* n. 101.— Rosenth. *op. cit.* 326.— *Psychotria undulata* Poir. *Suppl.* iv. 591.

[4] L. *Spec.* 470.—*R. pilosa* R. et Pav. *Fl. Per.* iii. 50.—*R. pilosa* K. *Nov. Gen. et Sp.* iii. 350, t. 279.—*Richardsonia brasiliensis* Gom. *Mém. Ipéc.* 31, t. 2.—Guib. *Drog. Simpl.* (ed. 7) iii. 92, fig. 604, 605.—DC. *Prodr.* iv. 567, n. 1.—*Spermacoce hirsuta* Rœm. et Sch. *Syst.* iii. 531; *Mantiss.* iii. 207 (*Poayo do campo* of the Brazilians.—*Ipecacuanha amylacé* Mér.).

[5] L. *Mantiss.* 52.—Lamk. *Ill.* t. 166, fig. 1.—DC. *Prodr.* iv. 471, n. 1.—*Apocynum fœtidum* Burm. *Fl. Ind.* 71 (*Somaraji*).

[6] Jacq. *Amer.* 68.—L. *Spec.* 246.—Tratt. *Tab.* t. 631.—Hook. *Ex. Fl.* t. 93.—Andr. *Bot. Repos.* t. 284.—Rosenth. *Syn. Pl. Diaph.* 329.—H. Bn. *Dict. Encycl. Sc. Méd.* xvi. 227 (*Petit Brasida, Raiz preta, Snowberry*).

[7] Mart. *Mat. Med. Bras.* 17, t. 6.—Cham. et Schlchtl. *Linnæa* (1829), 13.—H. Bn. *loc. cit.* 226.—Lindl. *Veg. Kingd.* 763.

[8] Mart. *loc. cit.* t. 5.—DC. *Prodr.* iv. 482, n. 3.—Rosenth. *loc. cit.* 329.—H. Bn. *loc. cit.* 226.—*C. brachiata* R. et Pav. *Fl. Per.* ii. t. 219, fig. *b*.—*C. parviflora* W.—*C. paniculata* W.—*C. racemosa* H. B. K. *Nov. Gen. et Sp.* iii. 352 (not Jacq.).—*C. pubescens* W. *Rœm. et Sch. Syst.* v. 202 (*Caïnça, Sipocruz, Serpentaria brasiliensis* off.).

[9] *Gardenia campanulata* Roxb. *Fl. Ind.* ii. 557.—DC. *Prodr.* iv. 383, n. 32.—Rosenth. *op. cit.* 849.—Kurz, *For. Fl. Brit. Burm.* ii. 40 (*Hsaythan-paya*). The plant is also used as an anthelmintic, and several other *Gardenias* have the same reputation in the country.

[10] Mart. *Mat. Med. Br.* i. 19, t. 7.—DC. *Prodr.* iv. 363, n. 8.—Rosenth. *op. cit.* 337.—? *M. glabra* Cham. et Schlchtl, *Linnæa* (1829), 159.

[11] A. S.-H. *Pl. Us. Bras.* t. 12.—*Borreria Poaya* DC. *Prodr.* iv. 549, n. 61 (*Poaya do campo*). *S. ferruginea* A. S.-H. *emetica* Mart. (*Poaya da hasta comprida*), *aspera* Aubl. *verticillata* Linn. *rigida* Salisb. *gentianoides* A. S.-H. *glaberrima*

236). Many South American *Rubiaceæ* are considered poisonous, particularly *Uragoga ruelliæfolia*,[1] *noxia*[2] and *Marcgravii*,[3] and *Bothriospora corymbosa*,[4] by using the wood of which as spits for roasting their meat the Indians are poisoned. In India *Genipa dumetorum*[5] is used to intoxicate fish; the pounded root is thrown into the stream and produces the same effects as the *Cocculus* of the Levant. The root of *Morinda Royoc*,[6] an American species, is said to be a violent purgative. Various parts of *M. citrifolia*[7] (fig. 275, 276) and *M. umbellata*[8] are used in tropical Asia in the treatment of dysentery. *Rubia noxia*[9] is reported in Brazil as extremely poisonous.

The Madders have quite different properties. That of the dyers[10] (fig. 223–230) is astringent; it is considered tonic, diuretic, aperitive, emmenagoguic; its root has been extolled as a specific against rickets, epilepsy and other nervous affections. *Rubia cordifolia*,[11] an Asiatic species, is said to be purgative, aperitive, emmenagoguic. The *Rubias* of the section *Galium* are said to cure certain nervous disorders. *R. Mollugo*[12] has been extolled for epilepsy and gout; *R. vera*[13] for epilepsy, hysteria, convulsions; *R. græca* for hæmorrhage and flux; *R. cruciata*[14] as astringent and vulnerary; *R. rigida*[15] as antiepileptic, and many others as astringents. Several have been indicated as

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A. S.-H. *sexangularis* Aubl. *latifolia* Aubl. *longifolia* Aubl. *prostrata* Aubl. *radicans* Aubl. *cærulescens* Aubl. are also used as Ipecacuanha, in various parts of tropical America.

[1] *Cephælis ruelliæfolia* Cham. et Schlchtl, *Linnæa* (1829), 134.—DC. *Prodr.* iv. 533, n. 4. The seed is used to kill rats and mice.

[2] *Psychotria noxia* A. S.-H. *Pl. Rem. Brés.* 234, t. 21, fig. A.—DC. *Prodr.* iv. 508, n. 41.

[3] *Palicourea Marcgravii* A. S.-H. *Pl. Rem. Brés.* 281, t. 22, fig. A.—DC. *Prodr.* iv. 525, n. 5.—Rosenth. *op. cit.* 326.—*Galvania Vellosi* Rœm. et Sch.—*Erva do rato* Marcgr. *Bras.* 60, fig. 2.

[4] Hook. f. *Icon.* t. 1069.—*Euosmia corymbosa* Benth. *Hook. Journ. Bot.* iii. 219.

[5] *Randia dumetorum* Lamk. *Ill.* t. 156, fig. 4. —*R. spinosa* Bl. *Bijdr.* 981.—*Ceriscus malabaricus* Gærtn. *Fruct.* i. t. 28, 140.—*Posoqueria dumetorum* Roxb. *Fl. Ind.* ii. 564.—*Canthium coronatum* Lamk. *Dict.* i. 602.

[6] L. *Spec.* 250.—Jacq. *Hort. Vindob.* t. 16.—*Roioc humifusum fructu cupressino* Plum. *Gen.* 11, t. 26.

[7] L. *Spec.* 250.—Gærtn. *Fruct.* i. 144, t. 29.—Rosenth. *op. cit.* 331.—*M. bracteata* Roxb. (ex Kurz, *For. Fl. Brit. Burm.* ii. 60). This plant has been introduced into America.

[8] L. *Spec.* 250.—DC. *Prodr.* iv. 449, n. 22.—*M. tetrandra* Jack. (ex Kurz).

[9] A. S.-H. *Pl. Rem. Brés.* 229.—DC. *Prodr.* iv. 592, n. 37. A species with trinerved leaves.

[10] *Rubia tinctorum* L. *Spec.* 158.—Lamk. *Ill.* t. 60, fig. 1.—Hayn. *Arzn.* xi. t. 5.—DC. *Prodr.* n. 11.—Gren. et Godr. *Fl. de Fr.* ii. 13.—Guib. *op. cit.* iii. 81.—Rosenth. *op. cit.* 321.—Berg et Schm. *Darst. Off. Gew.* t. 30 *b*.—*R. sylvestris* Mill. *Dict.* n. 1.

[11] L. *Mantiss.* 197.—DC. *Prodr.* n. 1.—Pall. *Voy.* t. L, fig. 1; ed. fr. t. 92.

[12] *Galium Mollugo* L. *Spec.* 155.—DC. *Prodr.* iv. 596, n. 18.—*G. erectum* Huds.—Gren. et Godr. *Fl. de Fr.* ii. 23.—*G. elatum* Thuill. *Fl. Par.* 76.—*G. boreale* Lapeyr. (not L.).

[13] *G. verum* L. *Spec.* 155.—DC. *Prodr.* n. 77. —*G. luteum* Mœnch.

[14] *G. Cruciata* Scop. *Fl. Carn.* i. 100.—H. Bn. *Dict. Encycl. Sc. Méd.* art. Galium.—*Valantia Cruciata* L. *Spec.* 1491.

[15] *G. rigidum* Ait. *Hort. Kew.* i. 144.

remedies for madness, particularly *R. palustris*,[1] *tricornis*,[2] *Aparine*.[3] The last has been recommended as aphrodisiac, antiscrofular and as a remedy for affections of the liver, lungs, &c. They are in fact very slightly active. Several have the reputation of easily curdling milk; whence the vulgar names applied to *R. Aparine*, *vera*, *Mollugo*, &c. The *Asperulas* are sometimes astringent, particularly *A. cynanchica*,[4] formerly prescribed for angina. *A. odorata*[5] (fig. 231) known by its agreeable odour, sometimes employed as tonic, stimulant, diuretic, vulnerary, is placed among linen to perfume it and protect it from insects, and on the banks of the Rhine a very common aromatic drink[6] is prepared from it. It is also a tinctorial plant, as are most of the *Rubieæ* presently mentioned, particularly *Rubia tinctorum*. A native of the Levant, this plant is renowned for the stability of its colour unequalled by the colouring matters of mineral origin, and it is of such ancient introduction that STRABO informs us of its cultivation as a tinctorial species by the Aquitani. That of the Levant is highly esteemed, and that cultivated in Venaissin is scarcely inferior in quality. Its chief colouring principles are alizarine and purpurine. There is also a trace of xanthine, a yellow principle, at first sweet, then bitter. The principles are extracted from the root in which they do not appear to exist originally but to be formed by oxydation; and the plant is banked up to increase the number of roots. Other *Rubias* are tinctorial: *R. peregrina*,[7] furnishing a red colour; in India, *R. cordata*,[8] yielding *Munjeeth*,[9] or Bengal madder; at Tong-dong, *R. angustissima*,[10] the roots of which are highly coloured; in Chili, *R. Relbun*[11] and *chilensis*;[12] in the Antilles, *R. guadalupensis*

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[1] *Galium palustre* L. *Spec.* 153.

[2] *G. tricorne* WITH. *Brit.* (ed. 2) 153.—DC. *Prodr.* n. 107.—*G. spurium* HUDS.

[3] *G. Aparine* L. *Spec.* 157.—DC. *Prodr.* n. 110.—*Valantia Aparine* LAMK. (part).—*Rubia tinctorum* LAP. (not L.)

[4] L. *Spec.* 151.—DC. *Prodr.* iv. 582, n. 9.—*Rubia cynanchica* J. BAUH. *Hist.* iii. 723, ic.—*Galium cynanchica* SCOP. *Fl. Carn.* n. 447.

[5] DOD. *Pempt.* 355.—L. *Spec.* 150.—DC. *Prodr.* iv. 585, n. 31; *Fl. Franç.* n. 3340.—GREN. et GODR. *Fl. de Fr.* ii. 47.

[6] *Maitrank*, *Maiwein*.

[7] L. *Spec.* 158.—SOW. *Engl. Bot.* t. 851.—DC. *Prodr.* iv. 589, n. 12.—GREN. et GODR. *Fl. de Fr.* ii. 13.—*R. angelica* HUDS.—*R. tinctorum*, var. α LAMK. *Fl. Fr.* ii. 605.

[8] THUNB. *Fl. Jap.* 60.—*R. Munjista* ROXB. *Fl. Ind.* i. 383.

[9] *Indian Madder*.

[10] Ex LINDL. *Veg. Kingd.* 770.

[11] CHAM. et SCHLCHTL, *Linnæa* (1828), 229.—DC. *Prodr.* iv. 592, n. 33.—*R. chilensis* W. (not MOL.).—*Galium Relbun* ENDL.—C. GAY, *Fl. Chil.* iii. 186.—*Rubiastrum* . . . FEUILL. *Obs.* iii. 60, t. 45.

[12] MOL. *Chil.* 118, not W.—DC. *Prodr.* iv. 590, n. 21.—*Galium chilense* ENDL. ex C. GAY, *loc. cit.* 180 (*Relbu*, *Relbun*).

and *hypocarpia*.[1] In the section *Galium* there are also a great many tinctorial species, but less used: *R. borealis*,[2] *sylvatica*,[3] *galioides*,[4] *tatarica*,[5] *Cruciata*, *Mollugo*, *Linnæana*[6] and *R. vera*, the yellow flowers of which are used to dye stuffs and, it is said, to colour Cheshire cheese. Several *Asperulas* are also used in dyeing: *A. odorata*, *arvensis*,[7] *tinctoria*,[8] *lævigata*,[9] *Aparine*[10] and *cynanchica*. Other series of the family likewise include tinctorial plants: *Chaya-vair*, the root of *Oldenlandia umbellata*,[11] an article of extensive commerce on the Coromandel coast, and *O. alata* and *crystallina*; *Morinda*, often rich in yellow or red colours, particularly *M. citrifolia*, above mentioned, and *M. Royoc*, *scandens*, *tetrandra*, *angustifolia*, *umbellata*, *tinctoria*, *Mudia*, *Chachuca*, *bracteata*. At Fernando-Po, *Urophyllum rubens*[12] is employed to dye stuffs red. At Malabar, the bark of *Hydrophylax maritima*[13] also gives a red dye; in Peru that of *Uragoga tinctoria*,[14] in Guyana that of *U. Simira*;[15] in tropical Asia several *Genipas* of the section *Gardenia*, as *G. grandiflora*, *arborea*; in America *G. Braziliensis*, the dye of which is a dark blue; *G. Caruto*[16] and *oblongifolia*,[17] which also yield dyes. Several *Sambuceæ* have colouring properties. The wood of the Black Elder[18] (fig. 387–389) yields, with alum, a yellowish brown colour, and with salts of iron a grayish brown. Its leaves and flowers are used to colour wax yellow; its fruit to deepen the colour

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[1] DC. *Prodr.* iv. 591, n. 32.—*R. Brownei* Spreng. (part) *Syst.* 397.—*Valantia hypocarpia* L. *Spec.* 1491.—Sw. *Obs.* 381.

[2] *G. boreale* L. *Spec.* 156.—Gren. et Godr. *Fl. de Fr.* ii. 17.

[3] L. *Spec.* 155.—DC. *Prodr.* n. 58.—*G. atrovirens* Lap. *Abr. Pyr.* Suppl. 22.

[4] *G. rubioides* L. *Spec.* 152.—DC. *Prodr.* n. 43.—Buxb. *Cent.* ii. t. 29.

[5] *G. tataricum* Trev. *Mag. Nat. Cur. Ber.* (1815) 146.—DC. *Prodr.* n. 41.

[6] *G. tinctorium* L. *Spec.* 153.—DC. *Prodr.* n. 31.—Torr. *Fl. Unit. St.* i. 166.

[7] L. *Spec.* 150.—DC. *Prodr.* iv. 581, n. 1.—Gren. et Godr. *Fl. de Fr.* ii. 49.—*A. cærulea* Mœnch.

[8] L. *Spec.* 150.—DC. *Prodr.* n. 8.—Gren. et Godr. *loc. cit.* 47.

[9] L. *Mantiss.* 38.—*A. rotundifolia* L.—*Galium rotundifolium* L.

[10] Bieb. *Fl. Taur.-Cauc.* 102; Suppl. 105.—*G. uliginosum* Pall.

[11] L. *Spec.* 174.—DC. *Prodr.* iv. 426, n. 22.—Guib. *op. cit.* iii. 83.

[12] Benth. *Hook. Niger Flora*, 396.—Hiern, *Fl. Trop. Afr.* iii. 73, n. 4.

[13] See page 444, note 7.

[14] *Psychotria tinctoria* R. et Pav.—Rosenth. *op. cit.* 326.

[15] *P. Simira* Rœm. et Sch. *Syst.* v. 187.—*P. parviflora* W. *Spec.* i. 962.—*Simira tinctoria* Aubl. *Guian.* i. 170, t. 65.

[16] H. B. K. ex DC. *Prodr.* iv. 378, n. 2.

[17] R. et Pav. *Fl. Per.* ii. 67, t. 220, fig. *a*.—DC. *Prodr.* n. 4.

[18] *Sambucus nigra* L. *Spec.* 385.—Duham. *Arbr.* ii. t. 65; ed. 2, i. t. 55.—DC. *Prodr.* iv. 322, n. 9.—Gren. et Godr. *Flora de Fr.* ii. 7.—Guib. *op. cit.* iii. 193.—Berg. et Schm. *Darst. Off. Gew.* t. 15 *d*. — Flück. et Hanb. *Pharmacogr.* 297.—*S. vulgaris* Lamk. *Fl. Fr.* iii. 369.

of wine. Those of the *Danewort*[1] (fig. 382–384), baked in vinegar, dye skins and cloth violet. The Romans, at festivals, painted the faces of their idols with it. The root of *Lonicera Periclymenum*[2] dyes pale blue; the leaves of *L.* (?) *corymbosa*,[3] of Chili, black; the shoots of *L. cærulea*[4] and *alpigena*[5] (fig. 379), apricot-yellow; but these plants are now little used.

A great many *Rubiaceæ* are rich in astringent or alkaloid matters which render them tonic, digestive, febrifuge. Those containing substances analogous to Catechu and often, for medicinal purposes, substituted for it, are the plants yielding Kino and Gambier. The most celebrated is *Ourouparia Gambir*[6] (fig. 349–354), a species from the shores of the Straits of Malacca chiefly from the numerous isles at the eastern extremity. It has probably been introduced there and is found also in Ceylon where it is not cultivated. It has been regularly cultivated at Singapore since 1819 for the medicinal extract, which is obtained by boiling the leaves and young branches in iron cauldrons; the liquid is then beaten in a particular manner with sticks[7] around which the Gambir collects in the form of a yellowish paste or mud; it is then placed in boxes and, when sufficiently hardened, is cut into small cubes. The cubes, of a reddish colour externally, more yellow internally, are full of needle-like crystals: they are said to consist entirely of catechic acid, and that the yellow colour of the mass is due to quercetin (?). It is thought that Gambir is also extracted from *Ourouparia acida*,[8] a Malay species, and from *O. ovalifolia* and *sclerophylla*. *Nauclea*, a near neighbour of *Ourouparia*,

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[1] *Sambucus Ebulus* L. *Spec.* 385.—Œd. *Fl. Dan.* t. 1156.—Sow. *Engl. Bot.* t. 475.—DC. *Prodr.* n. 1.—Lindl. *Fl. Med.* 446.—Caz. *Pl. Méd. Indig.* (ed. 3) 511.—*S. humilis* Lamk. *Fl. Fr.* iii. 370.

[2] L. *Spec.* 247.—DC. *Prodr.* iv. 331, n. 6.—*Periclymenum vulgare* Mœnch. — *Caprifolium Periclymenum* Rœm. et Sch.—*C. sylvaticum* Lamk. *Fl. Fr.* iii. 365.

[3] L. *Spec.* 249 ("apparently a *Rubiacea* Bert." ex DC. *Prodr.* iv. 338, n. 51).

[4] L. *Spec.* 249.— *Chamæcerasus cærulea* Delarb.—*Caprifolium cæruleum* Lamk.

[5] L. *Spec.* 248.—DC. *Prodr.* n. 39.—*Caprifolium alpinum* Gærtn. — Lamk.—*Chamæcerasus alpina* Delarb. — *Isika alpigena* Borck. — *I. lucida* Mœnch.

[6] *Nauclea Gambir* Hunt. *Trans. Linn. Soc.* ix. 218, t. 22.—*Uncaria Gambir* Roxb. *Fl. Ind.* ii. 126.—DC. *Prodr.* iv. 347, n. 1.—Guib. *Drog. Simpl.* (ed. 6) iii. 406, fig. 720.—Lindl. *Fl. Med.* 405.—Flück. et Hanb. *Pharmacogr.* 298. — *Funis uncatus angustifolius* Rumph. *Hort. Amb.* v. 63, t. 34.

[7] Often made of *Artocarpus*, the wood of which is light, porous and milky.

[8] *Uncaria acida* Roxb. *Fl. Ind.* ii. 129.—DC. *Prodr.* n. 2.—Berg et Schm. *Darst. Off. Gew.* t. 33 *c.*—*Nauclea acida* Hunt.—*N. longifolia* Poir. (ex DC.).—*Cinchona Kattukambar* Kœn. *Retz. Obs.* iv. 6.

has similar properties. *N. purpurea*,[1] from India, is an astringent medicine. The *Koss*[2] wood of Senegal is furnished by *N.* (*Mitragyne*) *inermis* (fig. 354); its bark is used by the natives as a febrifuge. Perhaps it is the African *N. orientalis* of which MUNGO PARK[3] speaks as employed in fumigations for reducing fever and which has also been referred to *Sarcocephalus esculentus*. Of *S. Cadamba*,[4] of India, extolled as a remedy for diarrhœa and colic, it is the fruit that is used.

Among the *Rubieæ* there are some astringent plants: *Rubia græca*,[5] a remedy for hæmorrhage and flux; *R. cruciata*, which our ancestors employed as a dressing for wounds, also *R. vera*. *Asperula odorata* (fig. 231) and *angustifolia* have similar properties. *Putoria calabrica*[6] is employed in the Mediterranean region as a gentle astringent. In the United States, *Cephalanthus occidentalis*[7] (fig. 345–348), the bark of which is bitter and astringent, is locally applied in the treatment of skin diseases; it has also been considered antisyphilitic. Several *Uragogas* of the section *Palicourea* are astringent. Others are evacuants like the Ipecacuanhas;[8] others again are poisonous.[9] Of the *Ixoras* some are astringent, others diuretic. The root of *I.* (*pavetta*) *indica*[10] (fig. 257–259) is bitter-aromatic; it is extolled in Malabar for dysentery, head-ache, intestinal obstruction, erysipelas, hæmorrhoids. *I. stricta*[11] is renowned in Java as a stimulant. In India *I. Bandhucca*[12] is prescribed for diarrhœa, intermittent fevers and cuta-

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[1] ROXB. *Pl. Corom.* i. 41, t. 54; *Fl. Ind.* ii. 123.—*Cephalanthus chinensis* LAMK. (part) *Dict.* i. 678 (ex DC. *Prodr.* iv. 346, n. 24).

[2] Or *Xosse* of the Spaniards, *Josse* GUIB. *Drog. Simpl.* (ed. 6) iii. 191.—H. BN. *Bull. Soc. Linn. Par.* 201.

[3] Ex HIERN, *Journ. Linn. Soc.* xvi. 261.

[4] KURZ, *For. Fl. Brit. Burm.* ii. 62.—*Nauclea Cadamba* ROXB. *Fl. Ind.* ii. 121.—DC. *Prodr.* iv. 344, n. 8.—*Anthocephalus ? Cadamba* MIQ. *Fl. Ind.-Bat.* ii. 135.—BEDD. *Fl. Sylv. Madr.* t. 33.—*Katon-jaka* RHEED. *Hort. Malab.* iii. t. 33 (ex DC.).

[5] *Galium græcum* L. *Mantiss.* 38.—SIBTH. *Fl. Græc.* t. 136.—LODD. *Bot. Cab.* t. 1373.

[6] PERS. *Syn.* i. 524.—DC. *Prodr.* iv. 577, n. 1.—*Asperula calabrica* L. F. *Suppl.* 120.—LHÉR. *St. Nov.* i. t. 32.—*Sherardia fœtida* LAMK. *Dict.* iv. 326.—*Pavetta fœtidissima* CYR.—*Ernodea montana* SIBTH. et SM.—*Lonicera sicula* UCR. (ex GUSS.).

[7] L. *Spec.* 138.—DUHAM. *Arbr.* i. t. 54.—SCHK. *Handb.* t. 5, 21.—LOIS. *Herb. Amat.* t. 272.—DC. *Prodr.* iv. 538, n. 1.—*C. oppositifolius* MŒNCH. *Meth.* 487.

[8] See ROSENTH. *op. cit.* 325. Also several species of the section *Cephælis* (*C. muscosa* SW. *guianensis* AUBL. *asthmatica* VAHL) and *Geophila macropoda* DC. and *reniformis* SCHLCHTL, which are herbaceous *Uragogas*.

[9] In Brazil there is a *Psychotria toxica* A. S.-H. *Nonatelia officinalis* AUBL. which with us is also a *Uragoga*, is considered an evacuant, aromatic medicine and is used in the treatment of asthma.

[10] *I. Pavetta* ROXB. *Fl. Ind.* i. 395.—*I. paniculata* LAMK.—*Pavetta indica* L. *Spec.* 160.—KER, *Bot. Reg.* t. 198.—*P. alba* VAHL.

[11] ROXB. *Fl. Ind.* i. 384.—*I. coccinea* CURT. *Bot. Mag.* t. 169 (ex DC. *Prodr.* iv. 486, n. 3).—*I. flammea* SALISB. (ex DC.).

[12] ROXB. *Fl. Ind.* i. 386.—DC. *Prodr.* n. 2.—*I. coccinea* L.—*Bandhuca* JONES, *As. Res.* iv. 250.—*Schetti* RHEED. *Hort. Malab.* ii. 13, t. 12 (ex HAM.).

neous affections. *I. grandiflora*[1] is accounted in the same country as astringent, and its fruit as diuretic. In the Moluccas, the root of *I. lanceolata*[2] is prescribed for pleurisy, pulmonary affections and dental decay. *I. congesta* Roxb. and *tenuiflora* Roxb. have similar properties. In Brazil the root of *Declieuxia Aristolochia*[3] is extolled as an emmenagogue. In India a decoction from the leaves of *Canthium parviflorum*[4] is employed against diarrhœa, and its root is said to be anthelmintic. The young leaves are eaten. Those of *C. Rheedii* DC. and its root are used in the treatment of hepatic maladies. Several *Morindas* are in repute as remedies for inflammatory affections, particularly *M. umbellata* and *citrifolia* (fig. 275, 276). Several *Guettardas* are equally astringent, especially *G. speciosa*[5] (fig. 286, 287), used, in India and the Indian Archipelago, in the treatment of wounds, ulcers, abscesses, and the bark, administered to women, facilitates and accelerates childbirth; *G. ambigua* DC. and *argentea*,[6] recommended as tonics in Guiana; *G. Angelica*,[7] the bitter and aromatic bark of which is employed, especially in Brazil, in veterinary medicine; and still more *G. verticillata*[8] and *dioica*,[9] of the Mascarene Isles, extolled beyond measure in that country for fever, hæmorrhage, diarrhœa and even for cholera. *Erithalis fruticosa*[10] is reputed tonic and stimulant in the Antilles. The wood contains an astringent resin, which gives it an agreeable perfume and is said to cure affections of the reins and bladder. *E. polygama*, from tropical Oceania, a *Guettarda* of the section *Timonius*,[11] is employed in the treatment of rheumatic fevers; its bark has the same use as Betel. *Ixora*, which has received the name of *Stylocoryne Rheedii*,[12] is used

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[1] Ker, *Bot. Reg.* t. 154.—Rosenth. *op. cit.* 329.—*Pavetta coccinea* Bl. *Bijdr.* 950.—*Schetti* Burm. *Thes. Zeyl.* t. 57.

[2] *Dict.* iii. 343 (part).—*I. fulgens* Roxb. (ex DC. *Prodr.* n. 6).—? *Bem-schetti* Rheed. *Hort. Malab.* ii. t. 57 (ex DC.).

[3] Mart. ex Rosenth. *op. cit.* 330.—*Asperula cyanea* Velloz.

[4] Lamk. *Dict.* i. 602.—DC. *Prodr.* iv. 474.—*Webera tetrandra* W. *Spec.* i. 1224.—*Kandenkura* Rheed. *Hort. Malab.* v. 71, t. 36.

[5] L. *Spec.* 1408 (not Aubl.).—Lamk. *Ill.* t. 154, fig. 2.—Roxb. *Fl. Ind.* ii. 521.—Bedd. *Fl. Sylv. Madr.* t. 17, fig. 2.—*Cadamba jasminiflora* Sonner. *Voy.* ii. t. 128.—*Gardenia speciosa* Roxb. ex Rosenth. *op. cit.* 332.—*Rava-pon* Rheed. *Hort. Malab.* iv. t. 47, 48.

[6] Lamk. *Dict.* iii. 54; *Ill.* t. 154, fig. 1.—*G. speciosa* Aubl. *Guian.* i. 320 (not L.).

[7] Mart. ex Rosenth. *op. cit.* 332 (*Raiz d'Angelica* of the Brazilians).

[8] *Malanea verticillata* Lamk. *Ill.* t. 66, fig. 1.—Desrx. *Lamk. Dict.* iii. 688.—*Antirhœa Lostœana* Commers. (ex J.).—*A. borbonica* Gmel. *Syst.* i. 244.—*A. verticillata* DC. *Prodr.* iv. 459, n. 1.—*Cunninghamia verticillata* W. *Spec.* i. 615 (*Bois de Losteau*).

[9] *Anthirœa dioica* Bory, ex DC. *Prodr.* n. 2.

[10] L. *Spec.* 251.—DC. *Prodr.* iv. 465, n. 1.—*E. odorifera* Jacq. *Amer.* 72, t. 173, fig. 23.—Rosenth. *op. cit.* 332 (*Epanille, Lignum nephreticum*).

[11] *T. Rumphii* DC. *Prodr.* iv. 461, n. 1.

[12] Kost. ex Rosenth. *op. cit.* 333, 1120.

as an emmenagogue and antidiarrhœtic in Malabar. *Wallichia porphyracea* MART.,[1] which is a *Urophyllum*, is also an astringent in Java; the buds are used. A decoction from the leaves of *Isertia coccinea*,[2] of tropical America, is used for fomentations and tonic lotions; the wood is bitter and the bark is used in the treatment of fevers and hepatitis. Several *Oldenlandias* are tonic and astringent, particularly *O. verticillata* L. and *Hedyotis Auricularia* L., which in Java is reputed to cure deafness; *O. umbellata*, used in the treatment of asthma and pulmonary affections; *O. herbacea*[3] which, mixed with Santal, honey or Caraway, is prescribed for fevers; *O. lactea*, extolled as an expectorant, and *O. alata* and *crystallina*, substituted for *O. umbellata*. The *Ophiorrhizas* derive their name from their well-established reputation in India and the neighbouring countries for healing the bites of venomous animals; particularly *O. japonica*[4] (fig. 321) and especially *O. Mungos*,[5] a species common in Java, Sumatra and Ceylon. In Cayenne *Sipanea pratensis*[6] is administered as an astringent for wounds, ulcers and urethral affections. *Wendlandia Lawsoniæ*[7] is employed in Malabar as tonic, antispasmodic, aromatic; the bark and fruit are used. *Rondeletia* is similarly used; in Mexico and Brazil it is often substituted for quinquina as tonic; the principal species thus employed are *R. febrifuga*,[8] *odorata*,[9] *americana*,[10] and some others which are said to yield an oil of Sainte-Marie. This name, however, is reserved in preference for a kind of tonic balm, used as a medicine, *Aceite Maria*, produced in Peru by *Elæagia Mariæ*,[11] and in New Granada by *E. utilis*.[12] *Bouvardia Jacquini*[13] (fig. 315–317) and *triphylla*[14] have also an astringent bark, considered

[1] ROSENTH. *op. cit.* 333.

[2] VAHL, *Ecl. Amer.* ii. 27.—DC. *Prodr.* iv. 437, n. 1.—*Guettarda coccinea* AUBL. *Guian.* i. 317, t. 123.—LAMK. *Ill.* t. 259.

[3] DC. *Prodr.* iv. 425, n. 8.—ROSENTH. *op. cit.* 334.—*Hedyotis herbacea* L. *Fl. Zeyl.* 65.

[4] BL. ex DC. *Prodr.* iv. 416, n. 13.

[5] L. *Amœn.* ii. 117; *Mat. Med.* 27, icon.—GÆRTN. *Fruct.* i. t. 55?—DC. *Prodr.* n. 1.—ROSENTH. *op. cit.* 335.—*Mungo* KÆMPF. *Amœn.* 573, 577 (*Hampaddu* of the Malays).

[6] AUBL. *Guian.* 147, t. 56.—DC. *Prodr.* iv. 414, n. 1.—ROSENTH. *op. cit.* 335.—*Virecta pratensis* VAHL, *Ecl. Amer.* ii. 11.

[7] DC. *Prodr.* iv. 413.—*Lawsonia purpurea* LAMK. *Dict.* iii. 107.—*Poutaletsje* RHEED. *Hort. Malab.* iv. t. 57 (*Barsoti*). *W. tinctoria* DC. is esteemed only for its colouring matter (*Toolalodh* of the Bengalese).

[8] MART. ex ROSENTH. *op. cit.* 335.

[9] JACQ. *Amer.* 59, t. 42.—H. B. K. *Nov. Gen. et Sp.* iii. 394.—DC. *Prodr.* iv. 408, n. 15.—*R. coccinea* SESS. et MOÇ. (ex DC.).

[10] L. *Spec.* 243.—DC. *Prodr.* n. 12. *R. jasminioidora* MACK. (ex ROSENTH. *op. cit.* 335) mentioned as yielding an oil of Sainte-Marie, is perhaps an *Elæagia*.

[11] WEDD. *Hist. Nat. Quinq.* 94, not.—WALP. *Ann.* ii. 777.

[12] WEDD. *loc. cit.*— *Condaminea utilis* GOUD. herb. (*Arbol del cera*).

[13] H. B. K. *Nov. Gen. et Sp.* iii. 385.—*Ixora americana* JACQ. *Hort. Schœnbr.* iii. t. 257.—*I. ternifolia* CAV. *Icon.* iv. 3, t. 305 (ex DC.).—*Houstonia coccinea* ANDR. *Bot. Repos.* t. 106.—*Tlacoxochilt* HERN. *Mex.* 231, icon.

[14] Var. (?) of the preceding. SALISB. *Par.* 88. —KER, *Bot. Reg.* t. 107.

a tonic in Mexico and used in the treatment of ulcers and abscesses. *Æginetia caranifera* Cav. which belongs also to the genus *Bouvardia*, contains a resin used for smoking meat. In Madagascar, Mauritius and Bourbon, the bark of *Danais fragrans*,[1] occasionally substituted for quinquina and which is also tinctorial, is used in the treatment of cutaneous affections and bears the name of *Bois à dartres*. In the Antilles, the *Catesbœas* are often called *Spinous Quinquinas;* the bark is tonic, digestive, particularly that of *C. spinosa* L.[2] The following are likewise reputed astringents, stomachics, tonics: in tropical Asia, *Cupia corymbosa* DC. and *Stylocoryne Rheedii* Kost. which with us belong to a section of the genus *Ixora;* several *Genipas*, as *Randia longiflora*,[3] employed in the treatment of ague; *R. dumetorum;*[4] *Gardenia florida*,[5] of China and India, renowned for the beauty and perfume of its flowers; *Gardenia Mussaendæ*,[6] of equinoxial America, which is also tinctorial; *G. radicans*,[7] of Japan; *G. gummifera*,[8] of Ceylon, from which exudes a resin similar to elemi; *G. arborea*,[9] of India, which yields the resin called *Decamali; G. Pavetta*,[10] of the same country, medicinally astringent; *G. Rothmannia*,[11] of the Cape of Good Hope; *G. malleifera*,[12] of western tropical Africa, rich in tannin and used by the natives for darkening the skin; *Genipa capensis*,[13] of

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[1] Commers. ex Lamk. *Ill.* t. 166, fig. 2.—DC. *Prodr.* iv. 361, n. 1.—Gærtn. f. *Fruct.* iii. 83, t. 195.—*Pœderia fragrans* Lamk. *Dict.* ii. 260.—? *Cinchona afro-inda* Willem. *Herb. Maur.* 16 (ex DC.).

[2] L. *Spec.* 159.—Lamk. *Ill.* t. 67, fig. 1.—Curt. *Bot. Mag.* t. 131.—DC. *Prodr.* iv. 401, n. 2.—*C. longiflora* Sw. *Prodr.* 30 (? *China spinosa* off.).

[3] Lamk. *Dict.* iii. 26; *Ill.* t. 156, fig. 3.—*R. aculeata* L. *Spec.* 214.—*R. mitis* L.—*Posoqueria longiflora* Roxb. *Fl. Ind.* ii. 569.—*P. multiflora* Bl. *Bijdr.* 980.

[4] Lamk. *Ill.* 227, t. 156, fig. 4.—DC. *Prodr.* iv. 385, n. 6.—Hiern, *Fl. Tr. Afr.* iii. 94; *Jn. Linn. Soc.* xvi. 260.—*R. spinosa* Bl. *Bijdr.* 981.—*Gardenia dumetorum* Retz. *Obs.* ii. 14.—Roxb. *Pl. Cor.* t. 136.—*G. spinosa* L. f. *Suppl.* 164.—Thunb. *Diss. Gard.* t. 2, fig. 4.—*G. dumosa* Salisb.—*Posoqueria dumetorum* Roxb. *Fl. Ind.* ii. 564.—*Ceriscus malabaricus* Gærtn. *Fruct.* i. t. 28.

L. *Spec.* 305.—DC. *Prodr.* iv. 379, n. 1.—*G. jasminoides* Soland.—Ell.

[6] Thunb. *Diss.* n. 5.—*G. maritima* Vahl.—*Mussaenda formosa* Jacq. *Amer.* t. 48.—*Randia Mussaendæ* DC. *Prodr.* iv. 388, n. 29.

[7] Thunb. *Diss.* n. 1, t. 1.—Andr. *Bot. Repos.* t. 491.—Ker, *Bot. Reg.* t. 73.

[8] L. f. *Suppl.* i. 64.

[9] Roxb. *Fl. Ind.* ii. 554.

[10] Hayn. ex Rosenth. *op. cit.* 349.

[11] L. f. *Suppl.* 165.—Harv. and Sond. *Fl. Cap.* iii. 6, n. 7.—*Rothmannia capensis* Thunb. *Act. Holm.* (1776) 65, fig. 2.

[12] Hook. *Bot. Mag.* t. 4307.—*G. Whitfieldi* Lindl. *Bot. Reg.* (1845) sub t. 47.—*R. malleifera* Bth. *Niger Fl.* 384.—*Randia malleifera* B. H. ex Hiern. *Fl. Tr. Afr.* iii. 98, n. 11 (*Blippo* of the natives).

[13] *Thunbergia capensis* Mont. *Act. Holm.* (1773) t. 11.—*Gardenia Thunbergia* L. f. ex Thunb. *Diss.* 11, 17, n. 3.—Hiern, *Fl. Tr. Afr.* iii. 100, n. 1.—*Bot. Mag.* t. 1004.—*G. verticillata* Lamk. *Dict.* ii. 607.—*G. speciosa* Salisb.—*G. crassicaulis* Salisb.—? *G. ternifolia* Schum.—*G. medicinalis* Vahl.—*G. lutea* Fresen.—*G. Tinneæ* Kotsch. et Heugl. *Bot. Zeit.* (1865) 173, t. 8. — *Bergkias* Sonn. — *Caquepiria Bergkia* Gmel. *Syst.* 651.

the same country, as also *G. resinifera*[1] and *G. Jovis tonantis*,[2] the branches of which are placed on the roofs of dwellings to protect them from lightning. Then the *Genipas* proper, all of American origin: *G. americana*[3] (fig. 296), very rich in an astringent tannic substance; *G. brasiliensis*,[4] employed in inflammatory and syphilitic attacks; *G. Caruto*[5] and *G. oblongifolia*,[6] which, in Mexico, the Antilles and Peru, have similar uses. The *Mussaendas* often have analogous properties. Thus *M. Landia*[7] (fig. 308, 309) serves as an astringent and febrifuge in Madagascar and the Mascarene islands; *M. frondosa*[8] is prescribed in Chinese India as tonic, expectorant, diuretic in phlegmatic, asthmatic and dropsical affections; *M. glabra*,[9] in India; *M. luteola*,[10] in Nubia and Arabia for the same disorders. At Sierra-Leone, *Canthium Afzelianum*[11] is used as an astringent against swellings in the legs and knees. The *Hamelias*, in America, are also employed in certain inflammatory conditions. *H. patens*[12] (fig. 306, 307) is prescribed for dysentery and scorbutic affections; a syrup made from the fruit is chiefly used. Tanners use the stems and leaves, which, as well as the fruit, cure itch and scab. This plant has been considered poisonous. In Arabia, *Virecta lanceolata*[13] (fig. 322, 323) is applied

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[1] *G. resinifera* Roth. *Nov. Sp.* 150.—Kurz, *For. Fl. Brit. Burm.* ii. 42, n. 8.—*G. lucida* Roxb. *Fl. Ind.* ii. 553.

[2] *Decameria Jovis tonantis* Welw. *Apuntam.* 579, not. 12.—*Gardenia Jovis tonantis* Hiern, *Fl. Trop. Afr.* iii. 101, n. 2; *Journ. Linn. Soc.* xvi. 260 (*N-day*, *Unday* of the natives).

[3] L. *Spec.* 251.—Plum. (ed. Burm.) t. 136.—*Genipa fructu ovato Plum.* T. *Inst.* 658, t. 436, 437 (1700).—*Gardenia Genipa* Sw. *Obs.* 84.

[4] Mart. ex Rosenth. *op. cit.* 349.—*G. americana* Velloz. (not L.) (*Genipabeiro* of the Brazilians).

[5] H. B. K. *Nov. Gen. et Sp.* 407.—DC. *Prodr.* iv. 378, n. 2.—Rosenth. *op. cit.* 350.

[6] R. et Pav. *Fl. Per.* ii. 67, t. 220, *a*.—DC. *Prodr.* n. 4.—*G. oblongifolia* Poir.

[7] Lamk. *Ill.* t. 157, fig. 2.—DC. *Prodr.* iv. 372, n. 16.—Smith, *Rees Cyclop.* n. 5.—*M. Stadmanni* Michx. ex DC. *Prodr.* n. 17.—*M. latifolia* Poir. —*M. holosericea* Sm.—*Rondeletia Landia* Spreng. (*Quinquina indigene*, in Mauritius, *Q. de Madagascar*). This plant, rather than *Danais*, is thought to be *Cinchona afro-inda* Willem. (see p. 379, note 1).

[8] L. *Spec.* 251.—DC. *Prodr.* n. 3.—Lamk. *Ill.* t. 157.—*M. formosa* L.—*M. zeylanica* Burm.—*M. Belilla* Ham.—*Belilla* Rheed. *Hort. Malab.* ii. 27, t. 17.

[9] Vahl, *Symb.* iii. 38.—Lodd. *Bot. Cab.* t. 1269.—*Folium Principissæ* Rumph. *Herb. Amboin.* iv. t. 51 (ex DC. *Prodr.* n. 4).

[10] Del. *Cent. Pl. Afr. Caill.* (1826) 65 (part), t. 1, fig. 1 (not Hochst.).—Hiern, *Fl. Tr. Afr.* iii. 71, n. 12.—*Vignaudia luteola* Schweinf. et Asch. *Enum.* 282.

[11] Hiern, *Fl. Tr. Afr.* iii. 142, n. 26.—*Pavetta parviflora* Afzel. *Rem. Guin.* vii. 47. — ? *P. Smeathmanni* DC. (ex Hiern).

[12] Jacq. *Amer.* 72, t. 50.—Sm. *Exot. Bot.* t. 24.—Gærtn. f. *Fruct.* iii. t. 196, fig. 3.—DC. *Prodr.* iv. 441, n. 1.—*H. coccinea* Sw.—*Duhamelia patens* Pers. *Syn.* i. 203.

[13] *Ophiorrhiza lanceolata* Forsk. *Fl. Æg.-Arab.* 42, n. 39.—*Manettia lanceolata* Vahl, *Symb.* i. 12.—*Neurocarpæa lanceolata* R. Br. *Salt. Abyss. App.* iv. lxiv.—*Vignaldia Quartiniana* A. Rich. *Fl. Abyss. Tent.* i. 357.—*Pentas carnea* Benth. *Bot. Mag.* t. 4086.—Hiern, *Fl. Tr. Afr.* iii. 46, n. 3.—*P. Quartiniana* Oliv. *Trans. Linn. Soc.* xxix. t. 46. — *P. Klotzschii* Vatk. — *Pentanisia nervosa* Kl. *Pet. Moss. Bot.* 287. — *P. cymosa* Kl. — *P. suffruticosa* Kl. *loc. cit.*

to bites of serpents and other venomous animals. *Portlandia grandiflora*,[1] of the Antilles, has a bitter, stomachic and tonic bark. *P. speciosa*,[2] of tropical America, has the same properties; its bark is also said to be febrifuge.

Diervilla acadiensis[3] or *lutea* (fig. 356), of North America, is also an astringent plant, reputed antisyphilitic. Many *Lonicereæ* have analogous properties. *Linnæa borealis*[4] (fig. 380) is used in Sweden in the treatment of gout, sciatica and rheumatism. The leaves of the honeysuckle[5] (fig. 371–376) have been used as in astringent gargles. *L. Periclymenum*[6] has the same properties. From *L. Xylosteum*[7] (fig. 378) is extracted an empyreumatic oil used in scorbutic and syphilitic affections, cold tumours and madness. *Symphoricarpos vulgaris*[8] and *racemosus*[9] (fig. 365–370) are reputed febrifuge in America; the young branches reduced to powder are said to be used. The *Sambuceæ*, on the contrary, are evacuant plants. The root of *Sambucus Ebulus* (fig. 382–384) is said to be violently purgative. Its leaves are extolled as dissolvents; they are esteemed in veterinary medicine for anasarca, putrescence, dropsy in the legs and farcy. The leaves and inner bark of the Black Elder are also purgative. *Sambucus racemosa*[10] and *canadensis*[11] (fig. 385, 386) have the same properties. *S. peruviana*[12] is purgative. *S. mexicana*[13] is extolled as

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[1] L. *Spec.* 244.—Jacq. *Amer.* t. 44.—Curt. *Bot. Mag.* t. 286.—DC. *Prodr.* iv. 405, n. 1.—Rosenth. *op. cit.* 336.

[2] *P. hexandra* Jacq. *Amer.* 63, t. 182, fig. 20.—*Coutarea speciosa* Aubl. *Guian.* i. 304, t. 122.—Lamk. *Ill.* t. 157.—DC. *Prodr.* iv. 350, n. 1.—Rosenth. *op. cit.* 346 (*Quina de Pernambuco, Cortex flava fibrosa* s. *Pseudo-Carthagena* off.).

[3] Duham. *Arbr.* i. t. 87 (1755).—*D. trifida* Mœnch. *Meth.* 492 (1794).—*D. Tournefortii* Michx. *Fl. Bor.-Amer.* i. 107 (1803).—*D. humilis* Pers. *Syn.* i. 214 (1805).—*D. canadensis* W. *Enum.* i. 222 (1809).—*D. lutea* Pursh. *Fl. Am. Sept.* i. 162 (1814).—*Lonicera Diervilla* L. *Mat. Med.* 62.

[4] L. *Spec.* 880; *Fl. Lapp.* (ed. 2) t. 12, fig. 4.—Sow. *Engl. Bot.* t. 433.—Schkuhr, *Handb.* t. 176.—Lamk. *Ill.* t. 536.—Wahlenb. *Fl. Lapp.* 170, t. 9, fig. 3.—Hook. *Fl. Lond.* v. t. 199.—Rosenth. *op. cit.* 351.

[5] *Lonicera Caprifolium* L. *Spec.* 246.—Sow. *Engl. Bot.* t. 799.—DC. *Prodr.* iv. 331, n. 1; *Fl. Fr.* iv. 270.—Gr. et Godr. *Fl. de Fr.* ii. 9.—*L. pallida* Host, *Fl. Austr.* i. 298.—*Periclymenum italicum* Mill. *Dict.* n. 5.—*Caprifolium hortense* Lamk.—*C. italicum* Rœm. et Sch.—*C. rotundifolium* Mœnch (*Patte-de-loup, Maire, Moire*).

[6] L. *Spec.* 247.—Gr. et Godr. *Fl. de Fr.* ii. 10 (*Cranquillier*).

[7] L. *Spec.* 248.—Duham. *Arbr.* ii. t. 54.—*Xylosteum dumetorum* Mœnch.—*X. vulgare* Rhl.—*C. dumetorum* Lamk. (*Chamécerisier, Camérisier, Soriau*).

[8] Michx. *Fl. Bor.-Amer.* i. 106.—*Symphoria conglomerata* Pers. *Syn.* i. 214.—*S. glomerata* Pursh.—*Lonicera Symphoricarpos* L. *Spec.* 249 (*Arbousier d'Amérique*).

[9] Michx. *loc. cit.* 107.—Sims, *Bot. Mag.* t. 2211.—*S. leucocarpa* hort.—*S. racemosa* Pursh.—? *S. heterophylla* Presl.

[10] L. *Spec.* 386.—Jacq. *Ic. Rar.* t. 59.—Duham. *Arbr.* t. 66.—Gren. et Godr. *Fl. de Fr.* ii. 7 (*Sureau de Montagne, S. à grappes*).

[11] L. *Spec.* 385.—Pursh, *Fl. Amer. Sept.* i. 203.—Schm. *Œstr. Baumz.* t. 142.

[12] H. B. K. *Nov. Gen. et Sp.* iii. 429.—*S. suaveolens* W. *Sch. Syst.* vi. 441.

[13] Presl, ex DC. *Prodr.* iv. 322, n. 7.

antisyphilitic. *S. javanica* and *australis* are considered purifying and diuretic. These properties in *Triosteum perfoliatum*,[1] an American plant with evacuant and diuretic root, are remarkable beside the astringent and rich tannic matters contained by so many *Rubiaceæ*. Singular too is it that *Viburnum*, so near a neighbour of the Elders, is indicated as comprising astringent plants. The leaves and fruit of *V. Lantana*[2] are employed as such; they are used in dyeing and making ink. *V. Opulus*[3] is also a tinctorial species.

Besides the astringent qualities possessed also in a high degree by their bark, the *Cinchonas*[4] have long been celebrated for their febrifuge properties. The first of these valuable plants known in Europe was *Cinchona officinalis*[5] (fig. 339, 340). The first trial was made in Madrid in 1639, a year after the famous cure of the wife of the viceroy of Peru, L. G. F. DE CABRERA Y BOBADILLA, fourth Count DE CHINCON, whose name, somewhat altered, LINNÆUS gave to the genus. It was only a few years previous to this that the Spaniards became acquainted with the *Cinchonas*, although the conquest dated from 1513, which goes to prove that the natives were in complete ignorance of the properties of these plants which many of them still regard as more dangerous than useful. Almost the only purpose for which they know them is for dyeing, several of them being rich in colouring matter. It was not till 1742 that the genus *Cinchona* was established, and it

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[1] L. *Spec.* 250.—BIGEL. *Med. Bot.* i. 90, t. 9.—LINDL. *Fl. Med.* 445.—DC. *Prodr.* iv. 330, n 1.—*T. majus* MICHX. *Fl. Bor.-Amer.* i. 107.—(?) *T. angustifolium* VAHL, *Symb.* iii. 37 (*Ipécacuanha de Virginie, Wild Ipecacuanha, Fever root*).

[2] L. *Spec.* 384.—GR. et GODR. *Fl. de Fr.* ii. 8.—*V. grandifolium* SM.—*V. tomentosum* LAMK. (*Viorne Mantanne, Moinsinne, Mansienne, Marselle, Coudre-Mansianne, Hardeau, Bardeau, Bourdaine blanche, Valinié*).

[3] L. *Spec.* 384.—GR. et GODR. *loc. cit.* 8.—*V. lobatum* LAMK. (*Sureau aquatique, des marais, Obier, Caillebot, Rose d'iète*). *V. odoratissimum* KER, of China and *cassinoides* L. of N. America are used for aromatic and stimulating infusions like tea.

[4] LAMB. *Cinchon.* (*Lond.* 1797).—ENDL. *Enchir.* 276.—LINDL. *Veg. Kingd.* 762; *Fl. Med.* 406.—PLANCH. (G.) *Des Quinq.* (Paris, 1864); *Guib. Drog. Simpl.* (ed. 7) iii. 102; *Dict. Enc. Sc. Med.* ser. 3, i. 272.—DEL. et BOUCH. *Quinol.* (Paris, 1854).—WEDD. *Hist. Nat. Quinq.* (Paris, 1849); *Ann. Sc. Nat.* ser. 5, xi. 346; xii. 24.—KARST. *Med. Chin. N.-Gran.* (Berlin, 1858); *Fl. Colomb.* (1854) 2 vol. pass.—How. *Ill. Nuev. Quin. Pav.* (Lond. 1862); *Quin. E. Ind. Plant.* (Lond. 1869).—MARKH. (C. R.) *Chin. Sp. N.-Gran.* (Lond. 1867).—MIQ. *De Cinch. Sp. Quibusd. Ann. Mus. Lugd.-Bat.* (1869).

[5] L. *Syst.* (ed. 10) 929; *Spec.* (ed. 1) 172, (ed. 2) 244.—HOOK. *Bot. Mag.* t. 5364.—TRI. *Nouv. Etud. Quin.* (Paris, 1870) 59.—FLÜCK. et HANB. *Pharm.* 303, 318.—MIQ. *loc. cit.* 13.—GUIB. *loc. cit.* 145, fig. 618, 619.—*C. Condaminea* H. B. *Pl. Æquin.* i. 33, t. 10.—DC. *Prodr.* iv. 352, n. 1.—WEDD. *Hist. Nat. Quin.* 32, t. 4, 4 *bis*, 5.—*C. Uritusinga* PAV. *loc. cit.*—TRI. *l. c.*—*Quina-quina* LA CONDAM. *Act. Acad. Par.* (1738) 114 (*Q. de Loxa, Cahuarguera colorado del Rey, C. amarilla del Rey, Crown-bark, Pale bark, Q. Palton*).

was twenty years later when LOPEZ and MUTIS discovered *C. lancifolia*,[1] *pitayensis*,[2] &c. in New Grenada. About the same period RUIZ and PAVON, a little later RENGIFO, discovered other species in Peru, particularly those called *Huanuco*, and especially the best red variety known, *C. succirubra*[3] (fig. 341). As recently as 1847 H. A. WEDDELL discovered, in Bolivia, the most southern and best yellow kind which he named *C. Calisaya*[4] (fig. 333–338). Now, the species of *Cinchona*[5] richest in active alkaloids[6] have been planted in abundance in the Indian possessions of England and Holland and their cultivation is commenced in some of the French colonies.

Many barks of false *Cinchonas* have been extolled; they are often rich in astringent principles but generally contain little or no alkaloid. They belong to the genera *Exostema*,[7] *Cascarilla*,[8] *Ladenbergia*,[9]

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[1] MUT. *Period. S.-Fé* (1793) n. 3, 465.—H. *Mag. Ges. Nat. Fr. Berl.* (1807) 116.—GUIB. *l. c.* 152.—KARST. *Fl. Colomb.* i. t. 11, 12; ii. 21.—TRI. *Nouv. Étud.* 58.—*C. amygdalifolia* WEDD.—*C. angustifolia* R. et PAV. *Suppl.* 14 (*Quina primitiva* MUT. *Q. jaune orangé de Mutis, Q. spongieux de Carthagène, Q. Colombia* off.).

[2] WEDD. *Ann. Sc. Nat.* ser. 3, xi. 269.—GUIB. *l. c.* 156.—TRI. *Nouv. Étud.* 61.—*C. lanceolata* BENTH. (not PAV.).—*C. Trianæ* KARST. *Fl. Col.* t. 45 (*Quin. Pitayo, Pitaya, red* and *brown Carthagena, Almaguer, Q. d'Antioquia*). WEDDELL unites this plant with *C. rugosa* PAV. (*C. Mutisii*, var. *rugosa*, G. PL.), in which he includes *C. Mutisii* LAMB. *hirsuta* PAV. *Pahudiana* HOW. *carabayensis* WEDD. and *Humboldtiana* LAMB.

[3] PAV. ex HOW. *Ill. N. Quin.* n. 9.—GUIB. *op. cit.* 169.—HANB. *op. cit.* 303, 318.—*C. ovata erythroderma* WEDD. *Quinq.* 61 (*Cascarilla colorada de Huaranda, China rubra, Red Cinchona, Red bark, Cascarilla roxa verdadera, Q. rouge verruqueux* and *non verruqueux, Q. rouge vif* and *rouge pâle*).

[4] WEDD. *Ann. Sc. Nat.* ser. 3, x. 6; *Hist. Nat. Quinq.* 30, t. 3, 4; 28, fig. 1–4.—TRI. *l. c.* 65.—GUIB. *op. cit.* 140, fig. 617.—BERG et SCHM. *Darst. Off. Gew.* t. 146.—*C. boliviana* WEDD. (*Q. jaune royal, Royal yellow bark, Bolivian bark, Cortex Chinæ regius*). WEDDELL has also made known the var. *Josephiana*, a shrub of low stature.

[5] Particularly, besides those mentioned hereafter, *C. macrocalyx* PAV. *Pahudiana* HOW. *micrantha* R. et PAV. *nitida* R. et PAV. *ovata* R. et PAV. *rotundifolia* PAV. *obovata* PAV. &c.

[6] Particularly quinidine and quinine ($C^{20}H^{24}N^2O^2$), and cinchonidine and cinchonine ($C^{20}H^{24}N^2O$), and quinamine ($C^{20}H^{26}N^2O^2$). In the experience of the government of Madras, the alcaloids presenting the least percentage of failures in the treatment of fevers are, Quinine 7 per cent. Quinidine 6 per cent.

[7] *E. angustifolium* R. et SCH. yields a febrifuge and tonic bark (*Cortex Chinæ angustifoliæ v. surinamensis*), as also *E. brachycarpum*, of Jamaica, *E. lineatum* R. et SCH. (*Ecorce de Ste.-Lucie*), *E. peruvianum* H. B. (*Quinquina du Pérou*) *E. cuspidatum* A. S.-H. (*Quina do mato*), *E. Souzanum* MART. (*Quina do Piauhy*) *E. formosum* CH. et SCHLCHTL (*Quina do Rio-de-Janeiro*) *E. longiflorum* R. et SCH. (*China caribæa spuria* off.) and *E. triflorum* (*Cinchona triflora* WRIGHT).

[8] *C. magnifolia* WEDD. (*C. magnifolia* R. et PAV.—*C. oblongifolia* MUT.—*Buena magnifolia* WEDD.) yields the *red Quinquina* of MUTIS (GUIB. *l. c.* 179, fig. 625). *C. macrocarpa* WEDD. (*Buena macrocarpa* WEDD.—*C. macrocarpa* VAHL. —? *C. ovalifolia* MUT.) produces the *white Q.* of MUTIS (GUIB. *l. c.* 182, fig. 626). TRIANA has given (*Nouv. Étud.* 69) the list of Columbian *Cascarillas*.

[9] A spurious Brazilian quinquina (*China nova brasiliensis, C. de Rio-Janeiro*) has been attributed to *L. hexandra* KL. (*Buena hexandra* POHL). *L. ovalifolia* KL. yields the *Cascarilla peluda* of Cuença. Other spurious quinquinas are produced by *L. cava* KL. *Lambertiana* KL. *Riedeliana* KL. *oblongifolia* KL. *obtusifolia* KL. *macrocarpa* KL. *dichotoma* KL. *stenocarpa* KL. and *acutifolia* KL. (ROSENTH. *op. cit.* 344–346), many of which are *Cascarillas* or *Lasionemas*.

Macrocnemum,[1] *Hippotis*,[2] *Remijia*,[3] *Condaminea*,[4] *Bathysa*.[5] In India, *Luculia gratissima*[6] and *Hymenodictyon excelsum*[7] produce a false *Cinchona* praised as a febrifuge; and in tropical Africa, *Crossopteryx febrifuga*[8] has a similar reputation. Besides the American species *E. caribæum*[9] (fig. 343) and *E. floribundum*[10] formerly renowned as febrifuges, the genus *Exostema* is represented in Oceania by *Badusa*,[11] which has similar properties They are said to be found also in another South Sea species, *Bikkea australis*[12] and in some congeneric plants of New Caledonia. The *Manettias* have been recommended as febrifuge; *M. cordifolia*,[13] however, is evacuant and is prescribed for dysentery, dropsy, &c.

The barks of the *Rubiaceæ* are rarely aromatic. More frequently the corolla has a sweet odour and contains much essence resembling Orange flower in perfume. The same is true of several *Gardenias*, particularly *G. florida* (fig. 297, 298) and *citriodora*; a great many *Ixoras*, whose name some of the perfumes bear; the Coffees, especially *Coffea arabica*, the odour of which has been compared with that of Jasmine; the *Cinchonas*, whose inflorescences are sometimes

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[1] ROSENTH. *op. cit.* 336.

[2] In Mexico *H. arborescens* (*Sommera arborescens* SCHLCHTL) yields a bitter bark, substituted for quinquina.

[3] A. SAINT-HILAIRE has described them as Brazilian *Cinchonas*, and has set forth their tonic and febrifuge virtues. They are principally *R. Vellozii* DC. (*Cinchona Vellozii* A. S.-H.) *R. ferruginea* DC. (*C. ferruginea* A. S.-H.) *R. Hilarii* DC. (*C. Remijiana* A. S.-H.) vulgarly named *Quina da campo, da serra, da Remijo*; *R. cujabensis* (*Quina da Cujaba*) and *R. Bergeriana*, *firmula* and *macrocnemia* WEDD. (ROSENTH. *op. cit.* 339, 340).

[4] *C. tinctoria* DC. furnishes the *Bark of Paraguatan*. *C. corymbosa* DC. (*Macrocnemum corymbosum* H. B.) has a tonic febrifuge tinctorial bark.

[5] To this genus belong *Exostema australe* and *cuspidatum* A. S.-H. (*Pl. Us. Bras.* t. 3).

[6] SWEET, *Br. Fl. Gard.* t. 145.—DC. *Prodr.* iv. 358.—*Cinchona gratissima* WALL. *Roxb. Fl. Ind.* ii. 154; *Tent. Fl. Nepal.* i. 30, t. 21.—*Mussaenda Luculia* HAM. (*Luculi Swa, Ussakoli, Cortex Chinæ nepalensis* off.).

[7] WALL. *Roxb. Fl. Ind.* ii. 149.—DC. *Prodr.* iv. 358, n. 1.—*Cinchona excelsa* ROXB. *Pl. Corom.* ii. 3, t. 106 (*Bundaroo* en telinga).

[8] BENTH. *Niger Fl.* 381.—*C. Kotschyana* FENZL, *Endl. Nov. St.* 46.—HIERN, *Fl. Tr. Afr.* iii. 44.—*Rondeletia febrifuga* AFZEL.—*R. africana* WINTERB. (*Bembee, Bellenda*).

[9] R. et SCH. *Syst.* v. 18.—DC. *Prodr.* iv. 359, n. 1.—GUIB. *op. cit.* iii. 187.—LINDL. *Fl. Med.* 430.—ROSENTH. *op. cit.* 337.—*Cinchona caribæa* JACQ. *Amer.* t. 179, f. 65; *Obs.* t. 17.—LAMB. *Cinch.* t. 4.—GÆRTN. *Fruct.* i. t. 33.—*C. jamaicensis* WRIGHT, *Trans. Soc. Roy. Lond.* lxvii. 504, t. 10 (*Quinquina caraïbe*).

[10] R. et SCH. *Syst.* v. 19.—DC. *Prodr.* n. 9.—*C. floribunda* SW. *Prodr.* 41.—*Fl. Ind. Occ.* 375.—LAMB. *Cinch.* 27, t. 7.—*C. montana* BAD.—*C. Luciana* VITM. *Quinquina Piton, Q. de Sainte-Lucie, Sea-side Beech*).

[11] *B. corymbifera* A. GRAY (p. 491, note 8).—*Cinchona corymbifera* FORST. *Act. Nov. Upsal.* iii. 176.—LAMB. *Cinch.* 25, t. 5.—*Exostemma corymbiferum* R. et SCH. *Syst.* v. 20.—DC. *Prodr.* n. 12.—ROSENTH. *op. cit.* 338.

[12] DC. *Prodr.* iv. 405.—*Bikkia grandiflora* REINW. *Bl. Bijdr.* 1017.—*Portlandia tetrandra* FORST. *Prodr.* n. 86 (*Quinquina de Sanaya*).

[13] MART. *Spec. Mat. Med. Bras.* i. 19, t. 7.—DC. *Prodr.* iv. 363, n. 8.—LINDL. *Fl. Med.* 432.—ROSENTH. *op. cit.* 337.

very odorous, as also frequently those of *Cascarilla*, *Remijia*, *Hillia*, *Luculia*, *Platycarpum*, *Chimarrhis*, *Portlandia*, *Rondeletia*, *Uncariopsis*, *Cœlospermum*, *Amaioua*, *Posoqueria*, *Oxyanthus*, *Pinckneya*, *Cremaspora*, *Uragoga*, *Lonicera*, *Sambucus*, &c. The wood of *Erithalis fruticosa* is useful, as we have said, in perfumery. The flowers of the common Honeysuckle are said to have been employed in the preparation of a sweet antispasmodic essence. Those of the Elder are sometimes not of a very agreeable odour. Those of *Sambucus nigra* and some other species are much employed in infusions, decoctions, fumigations, &c.; they are considered stimulant, diaphoretic, resolutive. Several *Rubias* of the section *Galium* have odorous flowers, sometimes rather nauseous. Those of *Rubia uliginosa* are considered antispasmodic, diaphoretic.[1] Every one knows the perfume of the leaves of *Asperula odorata*, discussed above. *Adoxa Moschatellina*[2] (fig. 390–395), from its musklike odour, has been reputed antispasmodic and recommended in affections of the ataxic and adynamic form. Its root has been considered a vulnerary and resolutive. The *Rubiaceæ* richest in aromatic essence are doubtless the Coffees. *Coffea arabica*[3] (fig. 251–256), said to be of African origin and now planted in all tropical regions of both worlds, is especially esteemed for its seeds, the horny albumen of which contains cafeine, an azotic principle extracted in fine needle-like crystals, and cafeic acid, a fatty matter, &c. By roasting a brown bitter soluble substance is produced and a thick bitter oil known as *cafeone* an almost imperceptible quantity of which will aromatize a quart of water, giving it the perfume so highly esteemed in the stimulating infusion of Coffee, a beverage alimentary from its azotic substance and a frugal medicine which is thought to diminish organic expenditure. Several substitutes for coffee have been sought among the indigenous *Rubiaceæ*, Madder and some species of *Galium*. In the tropics attempts have been made to substitute for the seeds of

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[1] The flowers of several *Viburnums* are used for making digestive tea-like infusions (*V. cassinoides* L. *V. canadense*, &c.).

[2] See p. 363, note 3. Rosenth. *op. cit.* 562.—H. Bn. *Dict. Encycl. Sc. Méd.* ser. 1, ii. 41.

[3] L. *Spec.* 245.—Tratt. *Tab.* t. 400.—Tuss. *Fl. Ant.* t. 18.—Turp. *Dict. Sc. Nat.* Atl. t. 99.—Juss. *Act. Acad. Par.* (1713) t. 7.—Ell. *Monogr.* (1774).—Till. *Pis.* t. 32.—Pluk. *Almag.* t. 272.—Gærtn. *Fruct.* i. t. 25.—Sims, *Bot. Mag.* t. 1303.—Lindl. *Fl. Med.* 440.—Guib. *Drog. Simpl.* (ed. 7) iii. 99, fig. 607.—Mér. et Del. *Dict. Mat. Méd.* ii. 345.—Rosenth. *op. cit.* 327.—*C. laurifolia* Salisb. *Prodr. St. Hort. Chap. All.* (1796) 62 (not H. B. K.).

the Coffee, those of several species of *Hypobathrum*,[1] *Uragoga*,[2] *Cremaspora*,[3] *Coffea mauritiana*,[4] or *Café marron* of the Mascarenes, *C. benghalensis*,[5] *stenophylla*,[6] *Zanguebariæ*,[7] *racemosa*.[8] The only species which may, in future, supply the place of *C. arabica*, of equally good quality but larger seeds, is *C. liberica*,[9] observed in a wild state in tropical western Africa, and already vigorously cultivated in British India and Java.

Beside the *Rubiaceæ* with aromatic essences, we may indicate those which by their fœtid odour approach the *Valerianeæ* and like them are sometimes recommended as antispasmodic. This character pertains to nearly the entire series of *Anthospermeæ*, particularly *Anthospermum æthiopicum*[10] (fig. 237, 238) and others from the Cape, whose odour is sometimes stinking. *Coprosma* owes its name to the same cause.[11] *Serissa fœtida*,[12] the root of which is bitter and astringent, and which is considered anthelminthic, has very fœtid leaves, as also another Chinese species, *S. Democritea*,[13] and several Asiatic species of *Leptodermis*.[14] *Pœderia fœtida*[15] (fig. 248–250) has an intolerable odour. Its decoction is employed in India against fevers, contusions, vertigo, retention of urine. Some species have been extolled for madness. Some plants of another series, *Uragoga*, are sometimes very fœtid, and beside them *Saprosma*, particularly *S. arboreum*,[16] which, in Java, has

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[1] *Coffea salicifolia* Miq. of Java, belongs to this genus.

[2] Particularly those named *Psychotria Brownei* Spr. *laxa* Sw. *marginata* Sw. *nervosa* Sw. *uliginosa* Sw.

[3] Especially *C. africana* Benth. which is *Coffea hirsutus* G. Don, and which we have shown to be *C. microcarpa* DC. (*Bull. Soc. Linn. Par.* 206).

[4] Lamk. *Dict.* i. 550; *Ill.* t. 160, fig. 2.—DC. *Prodr.* iv. 499, n. 2.—*C. arabica* var. β W. *Spec.* i. 974.—*C. sylvestris* W. (ex R. et Sch. *Syst.* v. 201).

[5] Roxb. *Cat. Hort. Calc.* 15; *Fl. Ind.* ii. 194.—DC. *Prodr.* n. 3.

[6] G. Don, *Gen. Syst.* iii. 581.—*C. arabica* Benth. (part) *Niger Fl.* 413 (not L.).

[7] Lour. *Fl. Cochinch.* (ed. 1790) 145.—*Amajoua africana* Spreng. *Syst.* ii. 126.

[8] Lour. *loc. cit.* 145 (not Pav.)—*C. ramosa* R. et Sch. *Syst.* i. 198.—*C. mozambicana* DC. *Prodr.* n. 18.

[9] Bull, ex Hiern, *Trans. Linn. Soc.* ser. 2, i. 171, t. 24; *Fl. Trop. Afr.* iii. 181, n. 2.—Hook. f. *Kew Gard. Rep.* (1877) 10, c. ic. mutuata.—*C. arabica* (part) Benth. *Niger Fl.* 413 (not L.).

[10] L. *Spec.* 1511; *Hort. Cliff.* t. 27.—Harv. and Sond. *Fl. Cap.* iii. 27.

[11] Particularly *C. lucida* and *fœtidissima* Forst. of New Zealand.

[12] Commers. *J. Gen.* 209 (not W.).—DC. *Prodr.* iv. 575.—Curt. *Bot. Mag.* t. 361.—Rosenth. *loc. cit.* 322.—*Lycium fœtidum* L. f. *Suppl.* 150.—*L. indicum* Retz. *Obs.* ii. 12.—*Dysoda fasciculata* Lour.—*D. fœtida* Salisb.—*Buchozia coprosmoides* Lhér.

[13] *Democritea serissoides* DC. *Prodr.* iv. 540. (M. Franchet has noted this fact.)

[14] Among others *Hamiltonia*.

[15] L. *Mantiss.* 52.—Lamk. *Ill.* t. 166, fig. 1.—DC. *Prodr.* iv. 471.—Rosenth. *op. cit.* 330, 1120.—*Apocynum fœtidum* Burm. *Fl. Ind.* 71 (*Bedalfee sutta*).

[16] Bl. *Bijdr.* 956.—DC. *Prodr.* iv. 493, n. 1 (*Lignum fœtidum javanicum*).

the reputation of curing colic, spasm, several nervous disorders, as hypochondria, hysteria, &c.

Some *Rubiaceæ* have edible fruit, particularly the *Genipas*. The Indians eat that of *G. americana* (fig. 296), which is astringent and not agreeable to Europeans, and make a sort of wine from its fermented juice; they also tattoo themselves with its pulp. The fruit of *G. Caruto* is used in the same way on the banks of the Orinoco. In Peru the fruit of *G. oblongifolia* is eaten; in Cayenne that of *Amaioua eriopila*[1] and *A. edulis*.[2] In tropical Africa, the compound fruit of *Sarcocephalus esculentus*[3] is eaten by the inhabitants, as also that of some species of *Oxyanthus* and of *Canthium edule*[4] (fig. 290–292). The small acid fruit of *Catesbæa spinosa*[5] and that of *Hamelia patens*, in the Antilles, are sometimes utilized, but are not esteemed. Those of *Isertia coccinea* and *Posoqueria drupacea*[6] are consumed in Guyana; but they are indifferent. Those of the Elders are sometimes eaten or used to make confectionary or beverages; a kind of brandy is made from the drupes of the Black Elder and the pulp is mixed with wine to colour it. The fruits of *Vibernum Opulus* and *Lantana* are also eaten but they are detestable. In India that of *Canthium parviflorum* is considered edible, as also in America that of *Mitchella repens*[7] (fig. 294), in Oceania that of *Guettarda speciosa* (fig. 286, 287), which is astringent and disagreeable.

The wood[8] of the *Rubiaceæ* is of indifferent quality, and large trees are not common in this family. Remarkable exceptions however are *Nauclea* and *Ourouparia*, the wood of which is of extreme hardness and might be used for the same purposes as Box. That of several

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[1] *Duroia eriopila* L. f. *Suppl.* 30, 209.—*Genipa Merianæ* Rich. *Rub.* 164.

[2] *Gardenia edulis* Poir. *Suppl.* ii. 708.—*Genipa edulis* Rich. (L.-C.).—*Alibertia edulis* Rich. (A.) *Rub.* 154, t. 11, fig. 1 (*Goyave noire*). The fruit of *Genipa mitis* is eaten and used in the preparation of an astringent extract. In Cochin China, that of *G. esculenta* Lour. is eaten; in America, that of *Gardenia Mussaenda* Thunb.; in Asia and Africa that of some species of *Gardenia*, *Randia* and *Oxyanthus*.

[3] Afzel. ex Sab. *Trans. Hort. Soc. Lond.* v. 442, t. 18.—Hiern, *Fl. Trop. Afr.* iii. 38.—*Cephalina esculenta* Schum. et Thönn. *Beskr Guin.* 105.—*Nauclea latifolia* Sm. *Rees Cyclop.* xxiii. n. 5.—? *N. sambucina* Wint. *Acc. S. Leone*, ii. 45 (*Doy*, *Amelliky*, at Sierra-Leone).

[4] *Vangueria edulis* Vahl, *Symb.* iii. 36.—DC. *Prodr.* iv. 454, n. 1.—*V. cymosa* Gærtn. f. *Fruct.* iii. 75, t. 193.—*V. madagascariensis* Gmel.—*V. Commersonii* Desf.—Jacq. *Hort. Schœnbr.* i. t. 44.—*V. venosa* Schimp.—*Vavanga edulis* Vahl, *Act. Hafn.* ii. p. i. 207, 208, t. 7.—*V. chinensis* Rohr. *V. spinosa* Roxb. of India has also edible fruit.

[5] L. *Spec.* 159.—Curt. *Bot. Mag.* t. 131.—*C. longiflora* Sw.

[6] *Randia ? drupacea* DC. *Prodr.* iv. 389.

[7] L. *Spec.* 161.—DC. *Prodr.* iv. 452, n. 1.

[8] That of *Cinchona*, *Anthocephalus*, *Nauclea*, *Gardenia*, *Coffea*, *Sambucus*, *Lonicera*, *Viburnum*, *Symphoricarpos*, has been specially studied by M. J. Moeller (*Beitr. zur Vergl. Anat. d. Holz. Denkschr. Wien. Akad. Wiss.* 1876).

Asiatic species is imperishable; particularly of *N. orientalis*, *excelsa*, *sessilifolia*, *cordifolia*,[1] *rotundifolia*, &c. That of *N. parvifolia* is light and not durable. That of several African *Genipas* is the best, particularly *G. Jovis tonantis*. The branches of *G. Thunbergia* (fig. 299–301) are sufficiently solid for them to be planted as hedges to prevent the passage of elephants. The pikes of the savages of Bongo are made of the branches of *G. dumetorum*, the wood of which is as hard as ebony. The Niam-niams make seats employed in the incantations of sorcerers from that of *Sarcocephalus Russeggeri*.[2] At the Cape, *Genipa capensis*[3] furnishes a sort of ironwood. In America that of *G. americana* is used for a variety of purposes, particularly in the manufacture of gun-carriages. Several *Ixoras* of the same country, as we know, have received the name of *Siderodendron*, and *S. triflorum* gives the ironwood of Martinique. *Burchellia bubalina*[4] (fig. 305) furnishes a buffalowood; *Guettarda racemosa*,[5] in the Antilles, a goldenwood; *Erithalis fruticosa*, a citronwood. The wood of *Hymenodictyon excelsum* of India has been compared to Mahogany. That of the *Cinchonas*, often soft, is used for domestic purposes. That of *Elæagia* contains, as we have said, a resinous oil. In Europe that of *Lonicera Periclymenum* is used for harrow-teeth, stays of looms, shanks of pipes, also made of the branches of *L. Xylosteum*. Those of the Elders are hollow; tubes and musical instruments are made of them. The pith is used for making paper, artificial flowers, toys, ornaments, stumps, &c.; botanists often use it for preparing microscopic sections. In America, the arrows of the Canadians are said to be made of the branches of *Viburnum dentatum*. The flexible branches of *V. Lantana* are used for cords. Those of *V. Opulus* yield a good charcoal for making gunpowder. Several *Loniceræ* are planted in ornamental fences, arbours, alcoves. Many species of *Lonicera*, *Symphoricarpos*,

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[1] See Bedd. *Fl. Sylv. S.-Ind.* cxxvij.—Kurz, *For. Fl. Brit. Burm.* ii. 64.

[2] Kotsch. ex Schweinf. *Rel. Kotsch.* 49, t. 33 (part).—Hiern, *Fl. Trop. Afr.* iii. 39; *Journ. Linn. Soc.* xvi. 260 (*Damma*).

[3] *Rothmannia capensis* Thunb. *Act. Holm.* (1778) 65, fig. 2.—*Gardenia Rothmannia* L. f. *Suppl.* 165.—Harv. and Sond. *Fl. Cap.* iii. 6, n. 7.—Rosenth. *op. cit.* 349.

[4] *B. capensis* R. Br. *Bot. Mag.* t. 466.—Harv. and Sond. *Fl. Cap.* iii. 3.—*B. parviflora* Lindl. *Bot. Reg.* t. 891.—*B. Kraussii* Hochst. *Flora* (1842), 237.—*Cinchona capensis* Burm. herb.—*Canephora capitata* Lamk. *Ill.* t. 151, fig. 2.—*Lonicera bubalina* L. f. *Suppl.* 146.—Thunb. *Fl. Cap.* 187 (*Buffeldoorn*).

[5] Lhér. ex Rosenth. *op. cit.* 332.

Viburnum and *Sambucus* are cultivated for their flowers and ornamental fruit. *Diervilla* and *Linnæa* of the section *Abelia* often have charming flowers and are nearly all hardy. In conservatories, the number of *Rubiaceæ* cultivated is considerable, esteemed either for their coloured sepals or bracts, as the *Mussaendas* and *Pinckneya pubens*, which has not been successfully cultivated among us, notwithstanding the great interest it has as a febrifuge medicine; or for the colour or odour of their flowers: more especially *Uragoga*, *Ixora*, *Guettarda*, *Bouvardia*, *Portlandia*, *Condaminea*, *Rondeletia*, *Lindenia*, *Virecta*, *Oldenlandia*, *Hamelia* and *Genipas* of the section *Gardenia*. The flowers of *G. florida* are an article of much commerce, chiefly for making bouquets; to the beauties of those of the white *Camellia* is added a sweet perfume, perhaps too strong. The flowers of *G. Thunbergia* (fig. 299–301), which are six or seven inches long, are most remarkable for their violet plumes. The most beautiful of the *Rubiaceæ* cultivated are probably the *Luculias*, particularly *L. gratissima*, now unfortunately rare in our conservatories, which, to the beauty of its flowers of a delicate rose colour, unites a sweet perfume similar to that of the Oranges. *L. Pinceana* is said to be still more remarkable. *Bouvardia*, with red or white flowers, adorns our gardens in summer. *Cephalanthus occidentalis* (fig. 345–348) is hardy in our gardens, but its flowers are not showy. The most infectious of the plants cultivated by us is indeed *Pœderia fœtida* (fig. 248–250).

GENERA.

I. RUBIEÆ.

1. **Rubia** T.—Flowers hermaphrodite or polygamous; receptacle very concave saclike, enclosing adnate germen; calyx 0. Corolla gamopetalous, rotate or subcampanulate; lobes 2, 3 or oftener 4 (*Galium*) or 5 (*Eurubia*), valvate. Stamens same in number, inserted in tube of corolla and alternating with lobes; filaments short; anthers sub-2-dymous, oftener exserted; cells 2, introrsely rimose. Germen 2- rarely by abortion 1-celled, crowned with simple or more rarely 2-lobed epigynous disk; style 2-fid or 2-partite; branches stigmatose at capitate apex. Ovules in cells solitary, more or less completely anatropous or amphitropous, ascending, basifixed; micropyle extrorsely inferior, raphe ventral. Fruit 2-dymous, fleshy (*Eurubia*, *Didymæa*) or coriaceous or dry (*Galium*, *Vaillantia*), by abortion sometimes 1-celled, externally glabrous, hispid, tuberculate, or longitudinally cristato-dentate (*Mericarpæa*); cocci 1-spermous. Seed ascending subpeltate, concave within; hilum broad; albumen thick horny; radicle of curved embryo inferior.—Herbs, rarely shrubby at base, generally scabrous, hispidulate or aculeate; branches oftener 4-gonal; leaves opposite; stipules interpetiolar conformed to leaves and spuriously verticillate with them, or more rarely small and not conformed to leaves (*Didymæa*); flowers (small) in axillary and terminal generally very compound, sometimes contracted cymes, exinvolucrate (*Eurubia*, *Didymæa*, *Mericarpæa*, *Galium*), or singly involucrate with 4 bracts (*Relbunium*), more rarely 3-nate, pendulous; each enclosed by a cymbiform accrescent bract (*Callipeltis*) or thickened by decurved connate pedicels; the middle one fertile. (*Warm, cold and temp. regions of the whole world.*)—See p. 257.

2. **Asperula** L.[1]—Flowers[2] nearly of *Rubia*, asepalous; corolla funnel-shaped or tubular-funnel-shaped,[3] valvate. Style branches 2, equal or subequal (*Euasperula*[4]), sometimes unequal (*Crucianella*[5]), capitate at apex (*Sherardia*[6]) or more rarely very short and approaching a simple capitellate style (*Phuopsis*[7]).—Herbs, rarely frutescent at base; leaves, stipules &c. of *Rubia*;[8] flowers ebracteate or involucrate, ebracteolate (*Euasperula*), sessile; or bracteate and 2-bracteolate (*Crucianella*), or spuriously capitate (in contracted cymes) involucrate, 2-bracteolate (*Phuopsis*), more rarely surrounded with bracts and bracteoles connate in a spurious involucre (*Sherardia*) and spuriously capitate. (*All temp. regions of the Old World.*[9])

II. SPERMACOCEÆ.

3. **Spermacoce** L.—Flowers hermaphrodite or more rarely polygamous; receptacle concave, various in form. Calyx 2-merous, oftener 4-merous; lobes dentiform equal; 2 lateral often larger; with few or ∞ denticules interposed. Corolla tubular, funnel-shaped or hypocrateriform; throat glabrous villose or pilose; lobes 4, or more rarely 5, 6, valvate. Stamens as many, inserted in throat or tube; anthers dorsifixed, introrse, 2-rimose, enclosed or exserted, more or less elongate. Germen 2-celled (rarely 3, 4-celled), crowned with short or thick, entire or 2-lobed disk; style slender more or less elongate, entire or oftener more or less deeply 2-lobed at stigmatose apex. Ovule in cells solitary, inserted at the middle of the septum or at

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[1] *Gen.* n. 121.—Juss. *Gen.* 196.—Gærtn. f. *Fruct.* iii. 89, t. 195.—Lamk. *Dict.* i. 297; Suppl. i. 483; *Ill.* t. 61.—Rich. *Rub.* 50, t. 1, fig. 1.—DC. *Prodr.* iv. 581.—Endl. *Gen.* n. 3103.—Spach, *Suit. à Buffon*, viii. 473.—B. H. *Gen.* ii. 150, n. 334.

[2] Small, white, pink, yellow or azure.

[3] See p. 260, note 5.

[4] *Asperula* of authors.

[5] L. *Gen.* n. 126.—Rich. *Rub.* 51.—DC. *Prodr.* iv. 586.—Endl. *Gen.* n. 3102.—Gærtn. *Fruct.* i. 111, t. 24.—B. H. *Gen.* ii. 150, n. 335.—*Laxmannia* Gmel. (ex Endl.).—*Rubeola* Mœnch. *Meth.* 525 (ex Endl.).

[6] Dill. *Gen.* 3.—L. *Gen.* n. 120 (name having priority).—Rich. *Rub.* 49.—DC. *Prodr.* iv. 581.—Gærtn. *Fruct.* i. 120, t. 24.—Endl. *Gen.* n. 3104.—H. Bn. *Payer Fam. Nat.* 231.—B. H. *Gen.* ii. 151, n. 337.—*Dillenia* Heist. *Hort. Helmst.* 435 (not L.).

[7] Griseb. *Spic. Fl. Rumel.* ii. 67.—B. H. *Gen.* ii. 151, n. 336.

[8] *Phuopsis* has ovule inserted at the base.

[9] Spec. about 110. Reichb. *Ic. Fl. Germ.* t. 1176 (*Crucianella*) 1177–1183.—Jaub. et Spach, *Ill. Pl. Or.* t. 82, 83, 196.—Sibth. *Fl. Græc.* t. 117–124, 139, 140 (*Crucianella*).—Trin. *Mém. Acad. Pétersb.* (1818) 485, t. 11 (*Crucianella*).—Sm. *Ex. Bot.* t. 109 (*Crucianella*).—Boiss. *Voy. Esp.* t. 83, 84; *Fl. Or.* iii. 19 (*Sherardia, Crucianella*), 25.—Benth. *Fl. Austral.* iii. 443.—Hook. f. *Fl. Tasm.* t. 40; *Handb. N. Zeal. Fl.* 121.—Willk. et Lang. *Prodr. Fl. Hisp.* ii. 300, 305 (*Crucianella*).—Gren. et Godr. *Fl. de Fr.* ii. 47, 49 (*Sherardia*), 50 (*Crucianella*).—Walp. *Rep.* ii. 460; vi. 19 (*Crucianella*), 22; *Ann.* ii. 738 (*Crucianella*), 739; v. 102.

various height, more or less completely anatropous; micropyle extrorsely inferior, sometimes somewhat lateral. Fruit coriaceous or crustaceous, oftener 2-coccous; cocci separable, dehiscing longitudinally within or at the apex, sometimes circumscissous at the base (*Hypodematium*) or at a variable height (*Mitrocarpum*); the cleft sometimes oblique (*Staelia*); carpels more rarely indehiscent (*Diodia, Dasycephala*). Seed ascending; albumen dense fleshy or oftener horny; cotyledons of axile embryo foliaceous, rarely narrow; radicle inferior terete.—Annual perennial or low shrubby herbs, glabrous or variously clothed; leaves opposite (rarely 3-nate), petiolate or sessile, penninerved or subrectinerved; stipules connate with leaves in variously setose sheath; flowers in cymes or compound axillary or terminal capituliform glomerules, variously bracteate, sometimes involucrate, more rarely (*Octodon*) intermingled with scales perceptibly thickened at the base and ciliate. (*All warm regions.*)—See p. 262.

4. **Richardia** Houst.[1]—Flowers (nearly of *Spermacoce*) hermaphrodite or polygamous; 3–6-merous; receptacle subglobular, obovoid or obconical. Lobes of calyx 3–8, evolute, persistent. Lobes of funnel-shaped corolla[2] 3–6, valvate. Stamens same in number, inserted in throat; anthers dorsifixed, enclosed or exserted. Disk annular depressed. Style slender; branches 3, 4, at stigmatose apex globosely capitate, subspathulate or linear-acute and recurved. Ovule inserted near middle of septum, amphitropous; micropyle extrorsely inferior. Fruit 3, 4-coccous, crowned with circumscissile or persistent calyx; cocci variously papillose or muricate, free from minute axis (or 0), dehiscing inwardly above or indehiscent; seeds sulcate at face; albumen horny; cotyledons of axile embryo foliaceous; radicle inferior terete.—Villose or hispid herbs, erect or creeping; leaves opposite; stipules interpetiolar, connate in a sheath plurisetose above; flowers in terminal spuriously capitate glomerules. (*Warm America.*[3])

5. **Perama** Aubl.[4]—Flowers (nearly of *Spermacoce*) 3, 4-merous; sepals (?) 2, lateral,[5] free or connate at base, elongate, more or less

[1] Ex. L. *Gen.* ed. 1 (1737), n. 439 (not K.).—Gærtn. *Fruct.* i. 123, t. 25.—*Ricardia* Houst. *Rel.* 5, t. 9 (1781),—*Richardsonia* K. *Mém. Mus.* iv. 430 (1818); *H. B. K. Nov. Gen. et Sp.* iii. t. 350 (not Neck.).—Rich. *Rub.* 74, t. 4, fig. 5.—DC. *Prodr.* iv. 567.—Endl. *Gen.* n. 3126.—B. H. *Gen.* ii. 147, n. 324.—*Schiedea* Bartl. (ex DC.).

[2] White, pink or lilac, sometimes rather large.

[3] Spec. about 6. Sweet, *Brit. Fl. Gard.* t. 91.—R. et Pav. *Fl. Per. et Chil.* t. 279.—A. S.-H. *Pl. Us. Bras.* t. 7, 8.—Griseb. *Fl. Brit. W.-Ind.* 351; *Cat. Pl. Cub.* 143 (*Richardsonia*).—Wawr. *Maxim. Reis. Bot.* t. 75 (*Richardsonia*).—Hiern, *Fl. Trop. Afr.* iii. 242.—Walp. *Rep.* vi. 31 (*Richardsonia*).

[4] *Guian.* i. 54, t. 18.—Endl. *Gen.* n. 3128.—B. H. *Gen.* ii. 147, n. 325.—*Mattuschkæa* Schreb. *Gen.* 788.—DC. *Prodr.* xi. 524.

[5] Bracteoles raised with receptacle.

deeply pinnatisect. Corolla funnel-shaped hypocrateriform; tube sometimes elongate; lobes valvate; throat pilose. Stamens 3, 4, inserted in throat; filaments short; anthers dorsifixed, sometimes apiculate, introrse, more or less exserted or enclosed, sometimes cohering marginally around style; cells introrsely rimose, sometimes barbate at base. Glandules of epigynous disk 2, free, sometimes high. Germen 2–4-celled; style slender exserted, at stigmatose apex subentire or 2–4-branched. Ovules in cells solitary, inserted at greater or less height on septum; micropyle extrorsely inferior. Fruit capsular membranous, 2–4-celled, circumscissile above middle; seeds ovoidly 3-quetral; embryo minute terete, richly albuminous.—Annual or perennial herbs; stem simple or slightly branched; villose or hirsute; branches slender; leaves small opposite or 3-nately verticillate; stipules interpetiolar very small or subnil; flowers [1] in spikes oftener short capituliform terminal or ramose (*Buchia*[2]), pedunculate, bracteate; bracts 1-floral, conformed to sepals, sometimes pinnatisect with them. (*South America.*[3])

6. **Triodon** DC.[4]—Flowers (nearly of *Spermacoce*) 4-merous; lobes of epigynous calyx 2–4; 2 lateral larger; a few denticules between. Corolla tubular-funnel-shaped, 4-lobed, valvate. Stamens 4, inserted in the hollows of the throat or mouth; anthers partly exserted. Disk rather concave, situate at the top of the 2-lobed germen; style inserted at bottom of hollow, erect, at apex divided into 2 teeth or branches. Ovules solitary, amphitropous, inserted on septum; micropyle extrorsely inferior. Fruit oftener obconical or obcordate; cells sometimes free above and there separated by a hollow. Seeds plano-convex, sulcate at face; albumen fleshy or rather hard; cotyledons of axile embryo superior subfoliaceous.—Small shrubs; branches virgate, 4-gonal; leaves small opposite or spuriously verticillate; stipules interpetiolar, sheathing, ciliate or incised at apex, persistent; flowers [5] in cymes or spicate or compound racemose glomerules, subulately-bracteolate.[6] (*Trop. America.*[7])

7 ? **Psyllocarpus** Mart. and Zucc.[8]—Flowers hermaphrodite

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[1] Very small, immerged in scales.

[2] H. B. K. *Nov. Gen. et Sp.* ii. 269, t. 132.

[3] Spec. 5, 6. A. S.-H. *Voy. Distr. Diam.* ii. 419.—Pœpp. et Endl. *Nov. Gen. et Sp.* t. 285.—Walp. *Rep.* ii. 467; vi. 31.

[4] DC. *Prodr.* iv. 566.—Endl. *Gen.* n. 3124.—B. H. *Gen.* ii. 143, n. 313.

[5] Small, pink or white (?).

[6] Rather a sect. of *Spermacoce ?*

[7] Spec. about 5. Cham. et Schlchtl, *Linnæa*, iii. 343 (*Diodia*).—Walp. *Rep.* vi. 30.

[8] *Nov. Gen. et Sp.* i. 44, t. 28.—DC. *Prodr.* iv. 570.—Endl. *Gen.* n. 3131.—B. H. *Gen.* ii. 146, n. 321.—*Diodois* Pohl, *Flora* (1825), 123.

(nearly of *Spermacoce*), 4-merous; receptacle short obconical. Calyx gamophyllous, short, 4–10-lobed; lobes very unequal; anterior and posterior minute; 2 lateral much larger elongate, acute, persistent. Lobes of short funnel-shaped corolla 4, valvate. Stamens short, enclosed, inserted in throat. Germen 2-celled, crowned with epigynous disk and short style, emarginate or 2-dentate at apex; ovule in cell 1, peltately inserted on septum; micropyle extrorsely inferior. Fruit dry, much compressed parallel to septum; valves 2, separable and crowned with half the calyx. Seed in each much compressed, orbicular-elliptical; hilum punctiform central; albumen copious; embryo terete elongate; cotyledons ovate-acute; radicle inferior.—Shrubs (oftener subericoid or subscoparious); branches slender virgate, 4-gonal; leaves linear subsessile connate ciliate sheathing stipules; flowers [1] axillary in glomerules, spuriously verticillate. (*Brazil.*[2])

8. **Gaillonia** A. Rich.[3]—Flowers hermaphrodite; receptacle ovoid, enclosing adnate germen. Calyx short, sometimes dilated, unequally 2–7-crenate or dentate; teeth sometimes growing to bristly plumes (*Jaubertia*). Tube of corolla often elongate; lobes 4, 5, valvate. Stamens same in number, inserted in hollows or throat, enclosed or exserted. Germen 2-celled; disk scarcely perceptible; branches of slender elongate style 2, short recurved. Ovules attached to septum; micropyle extrorsely inferior. Fruit 2-coccous; cocci indehiscent. Seed oblong; hilum ventral; albumen hard; radicle of axile embryo inferior elongate. Rigid branched shrublets, glabrous or more rarely variously clothed; leaves opposite small rigid acute; stipules connate in a sheath with leaves, more rarely remote from leaves, very small or 0; sheath entire or divided into 2 bristles or spines; flowers [4] solitary, cymose or in a spicate cyme.[5] (*West. Asia, north. Africa.*[6])

9 ? **Crusea** Cham. and Schlchtl.[7]—Flowers (nearly of *Spermacoce*) hermaphrodite, 4-merous; calycinal lobes elongate, persistent; denticules sometimes intervening. Corolla funnel-shaped; tube

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[1] Small, "azure."

[2] Spec. 4, 5. Walp. *Rep.* ii. 468.

[3] *Rub.* 73, t. 5, fig. 3.—DC. *Prodr.* iv. 574.—Endl. *Gen.* n. 3132.—Jaub. et Spach, *Ill. Pl. Or.* i. 133, t. 74–80.—B. H. *Gen.* ii. 144, 1229, n. 317.—Hook. *Fl. Ind.* iii. 201.—*Jaubertia* Guillem. *Ann. Sc. Nat.* ser. 2, xvi. 60.—Jaub. et Spach, *op. cit.* i. 17, t. 8.—? *Choulettia* Pomel, *N. Matér. Fl. Atl.* 81.

[4] Small, whitish.

[5] Sect. 4 (ex Jaub. et Spach, *loc. cit.*): 1. *Microstephus;* 2. *Hymenostephus;* 3. *Pterostephus;* 4. *Ptilostephus.*

[6] Spec. 8, 9. Boiss. *Fl. Or.* iii. 13.—Hiern, *Fl. Trop. Afr.* iii. 232.—Walp. *Rep.* vi. 32; *Ann.* v. 106.

[7] *Linnæa*, v. 165 (not Rich.).—DC. *Prodr.* iv. 566.—Endl. *Gen.* n. 3125.—L. Neum. *Rev. Hort.* (1863) 311, tab.—B. H. *Gen.* ii. 144, n. 316.

oftener very slender; throat glabrous; lobes of limb valvate or subreduplicate. Stamens inserted in mouth; anthers exserted, sometimes versatile. Disk thick, sometimes 2-lobed. Germen 2-celled; style at apex simple or with 2 linear branches; ovules attached to septum amphitropous, sometimes dorsally stipate to little-prominent placenta; micropyle extrorsely inferior. Fruit 2-coccous; cocci separable, indehiscent.—Glabrous or variously pubescent herbs; leaves opposite; stipules connate in ciliate sheath with petioles; flowers[1] in terminal compound capituliform glomerules, involucrate with 4 bracts.[2] (*South-west. and south. central N. America.*[3])

10. **Emmeorhiza** Pohl.[4]—Flowers hermaphrodite; calyx superior, 4-dentate; glandules setose sometimes with teeth interposed. Corolla short subrotate or subcampanulate; lobes 4, valvate. Stamens 4, inserted in mouth; filaments slender subulate; anthers oblong dorsifixed versatile, oftener exserted. Germen 2-celled; disk depressed, sometimes 2-lobed; style erect slender, dilated above to 2 stigmatose lobes; lobes oftener conical pointed. Ovule inserted in septum, ascending; micropyle inferior. Fruit obconical rather compressed, 2-coccous; cocci inwardly dehiscent. Seed oblong peltate; radicle of small albuminous embryo inferior. — Weak undershrubs, often twining; leaves opposite; stipules connate with petiole in hairy sheath; flowers[5] in very compound ramose corymbiform cymes. (*Tropical America.*[6])

11. **Hydrophylax** L. f.[7]—Flowers generally 4-merous (rarely 5, 6-merous); receptacle ovoid (*Ernodea*[8]) or oftener angular. Lobes of 4-partite calyx sublanceolate acute, persistent. Corolla tubular-campanulate, glabrous within (*Ernodea*) or more or less villose. Stamens 4, or more rarely 5, 6.[9] Germen 2-celled; style slender, at apex stigmatose entire or subentire capitellate. Fruit 2-coccous,

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[1] Pink or purple.

[2] Rather a sect. of *Spermacoce ?*

[3] Spec. about 8. Jacq. *Hort. Schœnbr.* t. 256 (*Spermacoce*).—Hook. and Arn. *Beech. Voy. Bot.* t. 99 c. — *Bot. Mag.* t. 1558 (*Spermacoce*).—Walp. *Rep.* ii. 466; vi. 31.

[4] *Flora* (1825), 183 (*Emmeorhiza*). — Endl. *Gen.* n. 3135[1].—B. H. *Gen.* ii. 146, n. 322.—*Endlichera* Presl, *Symb.* i. 73, t. 49.

[5] Very small, white or pink.

[6] Spec. about 2. DC. *Prodr.* iv. 575, n. 2 (*Machaonia*).—Griseb. *Fl. Brit. W.-Ind.* 351.—Walp. *Rep.* ii. 469; vi. 35.

[7] *Suppl.* (1781) 126.—Lamk. *Ill.* t. 76, fig. 1 (1793).—Rich. *Rub.* 78.—DC. *Prodr.* iv. 576.—Endl. *Gen.* n. 3113.—B. H. *Gen.* ii. 142, n. 311.—Hook. *Fl. Ind.* iii. 199.— *Sarissus* Gærtn. *Fruct.* i. 118, t. 25 (1788).

[8] Sw. *Prodr.* 29 (1783); *Fl. Ind. Occ.* i. 223, t. 4.—Juss. *Mém. Mus.* vi. 373.—Gærtn. *f. Fruct.* iii. 94, t. 196.—Rich. *Rub.* 76, t. 5, fig. 2.—DC. *Prodr.* iv. 575.—Endl. *Gen.* n. 3115.—B. H. *Gen.* ii. 142, n. 312.

[9] Exserted in *Ernodea littorali* whose filaments are oftener elongate.

subdrupaceous, slightly (*Ernodea*) or strongly ribbed; exocarp finally suberose; columella indistinct, 2-fid; albumen hard or fleshy.—Herbs, sometimes subshrubby, glabrous; leaves oblong opposite; stipules connate with petioles in subentire or lacerate sheath; flowers [1] axillary solitary subsessile. (*Seashores of E. India; south-east. Africa, Madagascar, Florida and the Antilles.*[2])

III. ANTHOSPERMEÆ.

12. **Anthospermum** L.—Flowers polygamo-dicœcious; receptacle in males short, in females ovoid saclike or obovoid, enclosing adnate germen. Calyx superior very short, 4, 5-dentate. Corolla gamopetalous, in male flower evolute subrotate or funnel-shaped, deeply 3–5-fid; lobes valvate, revolute; in female flower small or subabortive, tubular, shortly 2–4-lobed or dentate. Stamens 2–5 (in female flower very small or 0); filaments rarely thick (*Crocyllis*) or very slender, inserted in tube of corolla; anthers introrse dorsifixed oblong large, 2-rimose. Germen (in male flower minute effete) 2-celled; sometimes two empty cellules are formed in the septum (*Nenax*); disk epigynous small; style (in male flower short or 0) divided into 2 long filiform branches papillose throughout. Ovule in cells 1, erect, anatropous; micropyle extrorsely inferior. Fruit small, sub-2-dymous; cocci 2, crustaceous, separable, dehiscing longitudinally within or not at all; albumen of erect seed fleshy or rather hard; cotyledons of elongate embryo foliaceous, often elliptical; radicle inferior.—Glabrous or pubescent shrublets; leaves (generally ericoid) opposite or verticillate; stipules connate with base of leaves in membranous often 1–3-dentate sheath; flowers in axillary bracteolate glomerules or solitary, sometimes inserted on elongate axes of cyme. (*South. and trop. Africa, Madagascar.*)—See p. 266.

13. **Coprosma** Forst.[3]—Flowers (nearly of *Anthospermum*) dicœcious or polygamous; calyx very short annular or 4–6-dentate, sometimes

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[1] Rather large, lilac or sometimes yellowish.

[2] Spec. 3, 4. Roxb. *Pl. Corom.* t. 233.—Wight and Arn. *Prodr.* i. 441.—Wight, *Icon.* t. 760.—Harv. and Sond. *Fl. Cap.* iii. 25.—Griseb. *Fl. Brit. W.-Ind.* 347 (*Ernodea*).—Walp. *Rep.* ii. 463.

[3] *Char. Gen.* 137, t. 69.—J. *Gen.* 205; *Mém. Mus.* vi. 381.—Lamk. *Ill.* t. 186, 854.—Gærtn. f. *Fruct.* iii. 17, t. 182.—Rich. *Rub.* 57.—DC. *Prodr.* iv. 578.—Endl. *Gen.* n. 3109.—B. H. *Gen.* ii. 139, n. 301.—*Marquisia* Rich. *Rub.* 112.

subnil. Corolla funnel-shaped or subcampanulate; lobes 4–6, valvate. Stamens 4–6, inserted at bottom of corolla; filaments filiform; anthers basally dorsifixed oblong apiculate exserted (in female flower very small enclosed sterile or 0). Germen 2-celled (of *Anthospermum*) or more rarely 4-celled; style branches 2, often thick, separate from base, exserted, hispid-papillose. Fruit drupaceous; pyrenes 2–4, cartilaginous or osseous, 1-spermous. Seed ascending; albumen dense fleshy; cotyledons of axile embryo superior foliaceous. Other characters of *Anthospermum*.—Small trees or shrubs (fœtid); leaves opposite; stipules connate with petioles in sheath; flowers [1] solitary or cymose or glomerulate, axillar or terminal. (*Warm and temp. Oceania, Juan Fernandez.*[2])

14 ? **Normandia** Hook. f.[3]—Flowers (of *Coprosma*) polygamous;[4] receptacle obconical. Sepals 5, subulate, persistent. Corolla funnel-shaped; throat glabrous; lobes 5, short, valvate. Stamens 5, inserted at bottom of corolla, free; anthers dorsally inserted, in male flower exserted; cells produced at base to subulate point. Germen 2-celled; disk epigynous small; style branches 2, slender, free nearly from base, exserted. Ovules in cells solitary, erect; micropyle extrorsely inferior. Fruit 2-coccous; cocci dehiscing in the middle longitudinally within; albumen of erect seed fleshy; cotyledons of axile embryo suborbicular; radicle inferior.—A low glabrous virgate shrublet; leaves opposite shortly petiolate ovately acute nearly veinless, paler beneath; stipules interpetiolar, entire or divided; flowers in terminal compound-cymiferous corymbs.[5] (*New Caledonia.*[6])

15 ? **Nertera** Banks and Sol.[7]—Flowers hermaphrodite or polygamous (nearly of *Normandia*), 4, 5-merous; calyx short subentire or 4, 5-fid; lobes of narrow funnel-shaped corolla suberect, valvate.

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[1] Whitish or yellowish.

[2] Spec. about 30. Labill. *N. Holl.* t. 94 (*Canthium*), 95.—Endl. *Icon.* t. 111; *Prodr. Fl. Norfolk.* 61.—A. Gray, *Proc. Amer. Acad.* iv. 49, 306.—Hook. f. *Ant. Fl.* t. 13–16; *Fl. Tasm.* i. 165, t. 39; *Handb. New Zeal. Flora*, 110.—Miq. *Fl. Ind.-Bat.* ii. 327.—Benth. *Fl. Austral.* iii. 429.—F. Muell. *Fragm.* viii. 45; ix. 69, 186.—Wawr. *Flora* (1875), 323.—Walp. *Rep.* ii. 462; vi. 25; *Ann.* i. 370; v. 103.

[3] *Icon.* t. 1121; *Gen.* ii. 139, n. 302.

[4] "Hermaphrodite" (Hook. f.).

[5] A genus "with habit of *Psychotria*, flowers of *Coprosma* and fruit nearly of *Spermacoce*" (Hook. f.), better perhaps reduced to a sect. of *Coprosma*.

[6] Spec. 1. *N. Neo-Caledonica* Hook. f.

[7] *Gærtn. Fruct.* i. 124, t. 26 (1788).—J. *Mém. Mus.* vi. 373.—Rich. *Rub.* 139.—DC. *Prodr.* iv. 451.—Endl. *Gen.* n. 3187.—B. H. *Gen.* ii. 138, n. 300.—*Nerteria* Sm. *Icon. Ined.* ii. t. 28.—*Erythrodanum* Dup.-Th. *Fl. Trist. d'Acugna*, 41, t. 10, 11.—*Leptostigma* Arn. *Hook. Journ. Bot.* iii. 270.—*Cunina* Clos, *C. Cay Fl. Chil.* iii. 201, t. 34.—? *Gomosia* Mut. ex. L. f. *Suppl.* (1781) 17 (the name having priority and perhaps to be retained till its synonymy is determined).

Germen 2-celled; style branches free nearly from base filiform, far exserted, papillose. Fruit drupaceous or coriaceous (*Corynula*[1]); pyrenes 2, sometimes ribbed, 1-spermous. Other characters of *Normandia*.—Slender cæspitose perennial herbs; leaves opposite small ovate; stipules connate in sheath with leaves, dentate or shortly lobed; flowers[2] axillary solitary, pedunculate[3] (*Corynula*) or subsessile. (*South. Andean America, Ant. regions, N. Zealand, Australia, Sandwich and Philippine Isles.*[4])

16. **Serissa** COMMERS.[5] — Flowers hermaphrodite, 4–6-merous; lobes of calyx acute or subulate-lanceolate, persistent; denticules sometimes interposed. Lobes of funnel-shaped corolla 4–6 valvate subinduplicate; tube and throat densely papillose within. Stamens same in number; filaments inserted at greater or less height and connate with tube below, adnate to its base; anthers dorsifixed enclosed. Disk orbicular depressed. Germen 2-celled; style dilated above; branches subulate exserted hirsuto-papillose. Ovule erect; micropyle extrorsely inferior. Fruit externally rather fleshy (2-pyrenous?);[6] albumen of erect seed "fleshy; embryo erect central."—Branching shrubs, glabrous or puberulous (fœtid); leaves small opposite[7] acuminate subcoriaceous; stipules connate with petioles in a sheath setose above; flowers[8] axillary or terminal, solitary sessile or glomerulate. (*China, Japan.*[9])

17. **Galopina** THUNB.[10]—Flowers polygamo-diœcious, 4, 5-merous; receptacle enclosing germen in cavity obcordate or subdidymous and compressed contrary to septum. Calyx superior short, entire or 0. Corolla subrotate or funnel-shaped; tube short or very short; throat glabrous; lobes 4, 5, valvate, finally revolute. Stamens inserted in

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[1] HOOK. F. *Icon.* t. 1123; *Gen.* ii. 138, n. 299.

[2] Small, whitish. Fruit sometimes red.

[3] A genus scarcely differing from *Coprosma*: "*Corynula* ad *Coprosmam* facillime reducenda" (F. MUELL. *Fragm.* ix. 87).

[4] Spec. 4, 5. R. et PAV. *Fl. Per.* t. 90 (*Gomezia*).—HOOK. F. *Fl. N.-Zel.* t. 28; *Handb. N. Zeal. Fl.* 119; *Fl. Tasm.* 167.—CLOS, *loc. cit.* 200.—WAWR. *Flora* (1875), 330.—MIQ. *Fl. Ind.-Bat.* ii. 262; Suppl. 222.—BENTH. *Fl. Austral.* iii. 431.—WALP. *Rep.* ii. 486; vi. 48; *Ann.* v. 112.

[5] *J. Gen.* 209.—LAMK. *Ill.* t. 151.—RICH. *Rub.* 81.—DC. *Prodr.* iv. 575.—SPACH, *Suit. à Buffon*, viii. 468.—ENDL. *Gen.* n. 3117.—B. H. *Gen.* ii. 138, n. 298.—*Dysoda* LOUR. *Fl. Cochinch.* (ed. 1790) 145.—*Democritea* DC. *Prodr.* iv. 540.—*Buchozia* LHÉR. *Diss.* (ex DC.).

[6] "A berry" (LOUR. *loc. cit.* 146).

[7] Often approaching shortened ramules and spuriously fasciculate.

[8] Perianth oftener double in specimens grown in our gardens, but much more rarely single among the Chinese. Petals white.

[9] Spec. 2. THUNB. *Fl. Jap.* t. 17 (*Lycium*).—SALISB. *Prodr.* 60.—*Bot. Mag.* t. 361 (*Lycium*).

[10] *Diss. Gen. Nov.* i. 3.—CRUSE, *Rub. Cap.* 18.—J. *Mém. Mus.* vi. 371.—RICH. *Rub.* 60.—DC. *Prodr.* iv. 579.—ENDL. *Gen.* n. 3107.—B. H. *Gen.* ii. 139, n. 303. — *Oxyspermum* ECKL. et ZEYH. *Enum.* 364.

tube; anthers oblong dorsifixed exserted. Disk epigynous small or 0. Germen 2-celled; style branches 2, free from base slender exserted papillose. Ovules solitary; micropyle extrorsely inferior. Fruit obcordate-didymous, externally granular rugose or muricate; cocci 2, finally solute, indehiscent; septum narrow; albumen of erect seed fleshy; cotyledons of straight embryo superior foliaceous.—Erect perennial herbs; leaves opposite; stipules connate with petioles in a sheath 3-cuspidate on both sides at apex; flowers[1] in branched terminal racemes; pedicels very slender, bracteolate at base. (*South. Africa.*[2])

18 ? **Kelloggia** Torr.[3]—Flowers of *Galopina*, 4-merous; corolla funnel-shaped, narrowed to a tube at base; lobes valvate. Stamens inserted in throat; filaments short compressed; anthers elongate dorsifixed introrse versatile. Style 2-branched at apex; branches filiform papillose throughout. Fruit oblong, like the germen covered with hooked bristles; cocci 2, 1-seeded. Other characters of *Galopina*.[4]—Erect slender herbs; branches thin; leaves opposite sessile lanceolate; stipules broadly 3-angular interpetiolar; flowers in terminal 2-parous few-flowered cymes, articulate at top of pedicel. (*California.*[5])

19. **Cremocarpon** Bvn.[6]—Flowers (nearly of *Galopina*) 4-merous; lobes of short calyx ovate-acute. Lobes of corolla 4, valvate, each augmented externally below the apex by a short erect conical horn. Stamens 4; anthers oblong subsessile. Germen inferior, 2-celled; style 2-branched to apex. Glandules of epigynous disk 2, free thick obtuse. Fruit 2-coccous; cocci plano-convex, 5-ribbed[7] at back, solute from the 2-branched columella and finally pendulous from the top of the marginal and there furcate branches; albumen of suberect seed horny; embryo axile cylindrical.—A shrublet; leaves opposite elliptical-ovate or obovate; petiole slender; stipules 2-nate on both sides subulate recurved, connate at membranous base; flowers in axillary 2-chotomous cymes. (*Comoro is.*[8])

20. **Carpacoce** Sond.[9]—Flowers polygamous; receptacle unequally

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[1] Very small, deciduous.

[2] Spec. 2. Thunb. *Prodr.* 32 (*Anthospermum*).—Cruse, *Linnæa*, vi. 20 (*Phyllis*).—Harv. et Sond. *Fl. Cap.* iii. 26.

[3] *Unit. St. Explor. Exp. Bot.* ii. 322, t. 6.—B. H. *Gen.* ii. 137, n. 297.

[4] Of which rather a sect. ?

[5] Spec. 1 (v. 2 ?).

[6] Ex H. Bn. *Bull. Soc. Linn. Par.* 192.

[7] Like the *Umbelliferæ*.

[8] Spec. 1. *C. Boivinianum* H. Bn.

[9] *Fl. Cap.* iii. 32 (fruit sometimes, according to the author, 2-spermous, 2-dymous).—B. H. *Gen.* ii. 141, n. 307.—*Lagotis* E. Mey. exs. *Dreg.*

turbinate. Lobes of calyx 5, oftener very unequal. Corolla funnel-shaped or in female flower tubular; lobes 5, elongate, valvate, with dorsal horn under apex. Stamens 5; anthers large exserted. Germen inferior, 2-celled; one cell sterile; disk small; style elongate exserted, at stigmatose apex dilated incurved. Ovule in fertile cell 1, suberect; micropyle extrorsely inferior. Fruit subclavate, crowned with calyx, nearly dry; putamen rugulose, 1-spermous. Seed erect, with short fleshy aril at base; embryo axile; albumen dense fleshy.—Herbs or undershrubs; leaves opposite, narrow elongate, revolute at margin; stipules connate in a dentate-setose sheath connate with leaves; flowers axillary solitary, pedunculate or sessile. (*South. Africa.*[1])

21. **Otiophora** Zucc.[2]—Flowers 4, 5-merous; receptacle obconical or obovoid; lobes of calyx very unequal, persistent; the larger 1, 2, foliaceous accrescent. Corolla hypocrateriform; tube very slender elongate; lobes 4, 5, elongate, valvate, patent. Stamens same in number, inserted in throat; filaments very slender; anthers elongate exserted. Germen 2-celled; style branches 2, slender exserted glabrous; ovule in cells 1, erect; micropyle extrorsely inferior. Fruit membranous, sub-2-dymous, crowned with unequal calyx; cocci 2, solute, indehiscent. Seed erect oblong; testa dark; albumen densely fleshy; cotyledons of axile embryo superior foliaceous.—Herbs, sometimes subshrubby; leaves (small) opposite, ovate or lanceolate; stipules connate with petioles in setose sheath; flowers in loose terminal spikes, ebracteate, sometimes 2-nate. (*Madagascar.*[3])

22. **Plocama** Ait.[4]—Flowers 4–7-merous; germen inferior ovoid. Calyx superior, oftener 5, 6-dentate, persistent. Corolla subcampanulate, 4–7-lobed; lobes lanceolate, valvate, inflexed at apex. Stamens as many, inserted in throat; filaments erect rather short; anthers thick introrse. Germen 2-4-celled; disk epigynous minute; style at apex obtuse 2–4-dentate stigmatose. Ovules in cells solitary erect. Fruit baccate subglobular pulpy; seeds 2–4, erect, immersed

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[1] Spec. 3. Thunb. *Fl. Cap.* 158 (*Anthospermum*).—Cruse, *Linnæa*, vi. 17 (*Anthospermum*).—Reichb. *Spreng. Syst.* iv. 338 (*Anthospermum*).—Harv. and Sond. *Fl. Cap.* iii. 32.

[2] *Abhandl. Baier. Akad. Wissensch.* i. 315.—Endl. *Gen.* n. 3133.—B. H. *Gen.* ii. 137, n. 295.

[3] Spec. 2, 3. Walp. *Rep.* vi. 34.

[4] *Hort. Kew.* i. 292.—Gærtn. f. *Fruct.* iii. t. 96.—J. *Mém. Mus.* vi. 371.—Rich. *Rub.* 81.—DC. *Prodr.* iv. 577.—Endl. *Gen.* n. 3111.—B. H. *Gen.* ii. 136, n. 293.—*Placoma* Gmel. *Syst.* ii. p. i. 390.—*Placodium* Pers. *Synops.* i. 210.—*Bartlingia* Reichb. *Flora* (1824), 211 (not Ad. Br.).

in pulp; albumen scarce cartilaginous; cotyledons of thick axile embryo obtuse superior.—An erect (fœtid) shrub; branches numerous pendulous; leaves opposite or verticillate small linear acute; stipules connate in scarious sheath, persistent; flowers[1] crowded axillary and terminal or compound racemose. (*Canary Isles.*[2])

23. **Putoria** Pers.[3]—Flowers generally 4-merous; calyx superior unequally dentate, persistent. Corolla at base rather long-tubular; throat bare; limb patulous, 4-lobed, valvate. Stamens inserted in throat; filaments erect; anthers dorsifixed near base oblong introrse exserted. Disk epigynous rather thick. Germen 2-celled; style slender, 2-dentate at stigmatose apex. Fruit oblong drupaceous; pyrenes 1, 2, finally solute; flesh scanty. Seed oblong; albumen fleshy; cotyledons of large embryo narrow superior.—Low branched (fœtid) shrublets; leaves opposite linear-oblong; petioles short; stipules short interpetiolar; flowers[4] in terminal compound capituliform or umbelliform cymes; pedicels short or very short, bracteolate. (*Europe, Mediterranean Asia and Africa.*[5])

24. **Phyllis** L.[6]—Flowers polygamous; receptacle of males small; of female and hermaphrodite rather compressed obovate-pearshaped, longitudinally sulcate above. Sepals 4, 5, dentiform or larger, sometimes subnil, deciduous. Corolla shortly campanulate; lobes 4, 5, valvate, revolute. Stamens as many, inserted at bottom of tube; filaments very slender; anthers basally affixed introrse, exserted, 2-rimose. Germen 2-celled; ovule in cells 1, erect; micropyle extrorsely inferior; style branches 2, not thickened, everywhere papillose, in female flower exserted.—An undershrub; branchlets herbaceous terete; leaves opposite or verticillate, lanceolate; stipules connate with petioles in subentire sheath (black spotted); flowers[7] terminal and

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[1] Small or minute, very similar to those of *Anthospermum* and *Galopina*.

[2] Spec. 1. *P. pendula* Ait.—Reichb. *Icon. Exot.* t. 11.—Webb et Berth. *Phyt. Canar.* ii. 191.

[3] *Synops.* i. 524.—Rich. *Rub.* 80.—DC. *Prodr.* iv. 577 (part).—Endl. *Gen.* n. 3110.—B. H. *Gen.* ii. 136, n. 292.

[4] Pink or white, small or moderate.

[5] Spec. 2, 3. Lamk. *Dict.* iv. 326 (*Sherardia*).—Lhér. *Stirp.* t. 32 (*Asperula*).—Cyrill. *Pl. Neap.* t. 1 (*Pavetta*).—Sibth. *Fl. Græc.* t. 123 (*Ernodea*).—Reichb. *Ic. Fl. Germ.* t. 1182.—Sibth. et Sm. *Fl. Græc.* t. 143 (*Ernodea*).—Boiss. *Fl. Or.* iii. 12.—Willk. et Lang. *Prodr. Fl. Hisp.* ii. 299.

[6] *Gen.* n. 323.—J. *Gen.* 198; *Mém. Mus.* vi. 370.—Lamk. *Ill.* t. 186.—Gærtn. *Fruct.* i. 123, t. 25.—Rich. *Rub.* 60, t. 2, fig. 3.—DC. *Prodr.* iv. 578.—Endl. *Gen.* n. 3108.—H. Bn. *Payer Fam. Nat.* 232.—B. H. *Gen.* ii. 140, n. 305.—*Nobula* Adans. *Fam. des Pl.* ii. 146.—*Buplevroides* Boerh. (ex DC.).

[7] Greenish; styles whitish.

axillary compound-cymose; pedicels slender, ebracteolate; the fructiferous bare. (*Canary Isles, Madeira.*[1])

25. **Opercularia** GÆRTN.[2]—Flowers hermaphrodite or polygamous, spuriously capitate; calyx 3–6-merous, persistent. Corolla rather long tubular; lobes of patent limb 3–6, valvate; throat glabrous. Stamens same in number (more rarely 1–3), inserted at bottom of tube; filaments slender exserted; anthers introrse, dorsifixed above base. Germen inferior (adnate within concave receptacle); style branches 1, or oftener 2, generally free from base, exserted, papillose-hirsute. Ovule 1, suberect anatropous; micropyle extrorsely inferior. Fruit compound ("syncarpous"), generally augmented by persistent calyx, consisting of ∞, or more rarely 2, 3 (*Pomax*[3]) capsules; each finally 2-valvate; exterior valves connate in persistent cupule; interior in a spurious obconical deciduous operculum. Seeds oblong, smooth or rugose, plano- or concavo-convex; coat thin; cotyledons of richly and densely albuminous embryo superior foliaceous.—Undershrubs or herbs, rarely twining, glabrous or pilose (generally fœtid); leaves opposite; stipules connate with leaves in an interpetiolar sheath; flowers[4] in spurious terminal or lateral capitules,[5] involucrate and involucellate, stipitate or subsessile, sometimes ramose, many-flowered, or more rarely 2, 3-flowered (*Pomax*). (*Australia.*[6])

26. **Eleuthranthes** F. MUELL.[7]—Flowers of *Opercularia*, 4, 5-merous, crowded, spuriously capitate; germens (receptacles) free. Lobes of calyx 4, 5, linear, equal or unequal, hirsute, subspathulate, persistent. Corolla[8] thin funnel-shaped; lobes 4, 5, valvate, ciliate, revolute. Stamens inserted at base of corolla; filaments long very thin; anthers ovately acute introrse, versatile. Germen inferior, 1-celled, 1-ovulate (of *Opercularia*); style branches 2, slender, exserted

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[1] Spec. 1. *P. Nobla* L. *Spec.* 335.—DILL. *Hort. Elth.* 405, t. 299, fig. 386.—WEBB, *Phyt. Canar.* ii. 190.—*P. pauciflora* RICH.

[2] *Fruct.* i. 111, t. 24.—J. *Ann. Mus.* iv. 427, t. 70, 71.—RICH. *Rub.* 64, t. 3, fig. 2.—DC. *Prodr.* iv. 615.—TURP. *Dict. Sc. Nat.* Atl. t. 102.—ENDL. *Gen.* n. 3097.—B. H. *Gen.* ii. 141, n. 308.—*Rubioides* SOLAND. (ex GÆRTN.).—*Cryptospermum* YOUNG, *Trans. Linn. Soc.* iii. 30, t. 5.

[3] SOLAND. ex GÆRTN. *op. cit.* 112, t. 24.—J. *Mém. Mus.* iv. 426.—LAMK. *Ill.* t. 58.—RICH. *Rub.* 65, t. 3, fig. 1.—DC. *Prodr.* iv. 615.—ENDL. *Gen.* n. 3096.—B. H. *Gen.* ii. 141, n. 309.

[4] Small, white or violet.

[5] Consisting of simple or oftener compound glomerules.

[6] Spec. about 15. LABILL. *Pl. N.-Holl.* t. 46–48.—BENTH. *Fl. Austral.* iii. 432, 436 (*Pomax*).—F. MUELL. *Fragm.* ix. 187 (*Pomax*).—HOOK. F. *Fl. Tasm.* 166, t. 38.—WALP. *Rep.* ii. 454; vi. 8.

[7] *Fragm.* iv. 92.—BENTH. *Fl. Austral.* iii. 437.—B. H. *Gen.* ii. 142, n. 310.

[8] Nearly of *Spermacoce.*

papillose. Fruit free dry hirsute; exocarp solute from endocarp; seed . . . ?—A small hirsute annual;[1] leaves opposite ovately acute, petiolate; stipules connate in sheath; cymes many-flowered capituliform terminal, ebracteolate. (*South west. Australia.*[2])

27. **Hamiltonia** Roxb.[3]—Flowers hermaphrodite or 2-morphous (nearly of *Serissa*); calyx lobes 5,[4] ovately acute or subulate, sometimes ciliate, persistent. Corolla funnel-shaped, sometimes pilose within, valvate or induplicate. Stamens 5; anthers introrse, exserted or enclosed (sometimes effete in female flower). Germen inferior; cells 5, oppositipetalous; style branches 5 stigmatose, papillose, connate at base (*Leptodermis*[5]) sometimes higher. Ovules in cells solitary ascending; micropyle extrorsely inferior.[6] Fruit capsular, 4, 5-valvate from base (*Leptodermis*) or from apex (*Euhamiltonia*); endocarp solute from exocarp and persistent around seed in a more or less fibrous reticulate sac, sometimes 3-valved at base; seeds albuminous; cotyledons of straight embryo foliaceous, sometimes induplicate.—Glabrous or variously clothed shrubs; leaves (fœtid) opposite, ovato-lanceolate; stipules intrapetiolar, broad, persistent; flowers[7] in terminal or axillary cymes,[8] subsessile (*Leptodermis*) or pedunculate pedicellate and racemose; bracts and bracteoles pointed, sometimes connate by pairs in an involucre or involucel.[9] (*Trop. and subtrop. east. Asia.*[10])

28. **Pseudopyxis** Miq.[11]—Flowers[12] hermaphrodite; receptacle obconical concave, enclosing adnate germen and produced above to an epigynous cupule glandular within. Sepals 5, inserted at margin of cupule, ovato-lanceolate, persistent, finally perceptibly reticulate-

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[1] Of singular aspect; the inflorescences resembling those of some small *Trifoliums*.

[2] Spec. 1. *E. opercularina* F. Muell.

[3] *Hort. Calc.* 15 (1814); *Fl. Ind.* i. 554 (not Muehl.).—DC. *Prodr.* iv. 462.—Endl. *Gen.* n. 3201.—B. H. *Gen.* ii. 135, n. 289.—H. Bn. *Bull. Soc. Linn. Par.* 214 (1879).—Hook. *Fl. Ind.* iii. 197.—*Spermadictyon* Roxb. *Pl. Corom.* iii. 32, t. 236 (1819).

[4] Or more rarely 4.

[5] Wall. *Roxb. Fl. Ind.* (ed. Carey) ii. 191.—Rich. *Rub.* 141.—DC. *Prodr.* iv. 462.—Endl. *Gen.* n. 3202.—B. H. *Gen.* ii. 135, n. 290.—Hook. *Fl. Ind.* iii. 198.

[6] Sometimes closed by a small dilatation of the short funicle; coat simple incomplete.

[7] White, pink or azure, sometimes odorous.

[8] Sometimes centrifugal, 2-seriately superposed; each 2-bracteolate (*H. lanceolata*).

[9] A genus in our opinion very near *Serissa*, differing chiefly in the germen with isomerous perianth.

[10] Spec. 6, 7. Don, *Prodr. Fl. Nepal.* 137.—Lindl. *Bot. Reg.* t. 348, 1232.—Dcne. *Jacquem. Voy. Bot.* t. 91 (whence fig. 246, 247, are taken).—Walp. *Rep.* ii. 488; vi. 50.

[11] *Ann. Mus. Lugd.-Bat.* iii. 189.—B. H. *Gen.* ii. 135, n. 291.

[12] Pink, rather large.

veined. Corolla funnel-shaped; lobes 5, acute, valvate, scantily pubescent within. Stamens 5, inserted under throat; anthers subsessile dorsifixed, oblong, enclosed, introrsely 2-rimose. Germen inferior, 4, 5-celled; style girt at base with slightly prominent disk, apex shortly exserted, 4, 5-branched, papillose throughout. Ovules in cells solitary ascending; micropyle extrorsely inferior.[1] Fruit crowned with calyx; "cocci 4, 5, indehiscent; seeds . . . ?"—Low pilose perennial herbs;[2] rhizome creeping; leaves opposite ovato-cordate, petiolate; stipules interpetiolar short glandular-dentate; flowers terminal solitary or cymose few.[3] (*Japan.*[4])

29. **Pæderia** L.[5]—Flowers hermaphrodite or polygamous, 4, 5-merous; calycinal lobes or teeth more or less deep, persistent. Corolla tubular or funnel-shaped, often pubescent; throat bare, glabrous or villose; lobes 4, 5, attenuate at margin more or less induplicate; tube sometimes divided between staminal filaments. Stamens 4, 5, inserted at variable height; anthers introrse. Germen inferior, compressed, 2-celled, more rarely 3-celled; disk epigynous depressed or tumid; branches of (2-morphous) style slender papillose, sometimes exserted, finally contorted. Ovules solitary suberect; micropyle extrorsely inferior. Fruit subglobular or oftener compressed parallel to septum; exocarp fragile smooth separating from pyrenes and breaking irregularly, sometimes attenuate and aliform at margin; pyrenes finally solute and connected by branched fibrous bundles, those interior to cocci scanty or 0, but the dorsal generally more evolved; pyrenes indehiscent, nucleus 1-seeded; seed much compressed albuminous.—Climbing (fœtid) shrubs or undershrubs; branchlets flexible; leaves opposite or verticillate, petiolate, ovato-acute or lanceolate; stipules various, oftener deciduous; flowers in compound axillary and terminal cymes; cymes sometimes 1-parous; bracts small or rather

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[1] Transversely plicate.

[2] Habit of *Ophiorrhiza* or *Coccocypselum* and some small *Gessneriaceæ*.

[3] A genus of *Boragineæ* (Miq.), certainly of *Rubiaceæ* (Maxim.).

[4] Spec. 1. *P. depressa* Miq. *loc. cit.*

[5] *Mantiss.* 7, 52.—J. *Gen.* 205 (part); *Mém. Mus.* vi. 381.—Lamk. *Ill.* t. 166, fig. 1.—Gærtn. f. *Fruct.* iii. 84, t. 195.—Rich. *Rub.* 114.—DC. *Prodr.* iv. 471.—Endl. *Gen.* n. 3180.—B. H. *Gen.* ii. 133, n. 286.—H. Bn. *Bull. Soc. Linn. Par.* 190.—Baker, *Fl. Maurit.* 158.—Hook. *Fl. Ind.* iii. 195.—*Hondbessen* Adans. *Fam. des Pl.* ii. 158.—*Lygodisodea* R. et Pav. *Prodr.* 32, t. 5; *Fl. Per. et Chil.* ii. 48, t. 188.—Bartl. *Ord. Nat.* 208.—DC. *Prodr.* iv. 470.—Hook. *Journ. Bot.* ii. t. 2.—Endl. *Gen.* n. 3182.—B. H. *Gen.* ii. 134, n. 287.—*Disodea* Pers. *Synops.* i. 210.—J. *Mém. Mus.* vi. 381.—*Siphomeris* Boj. *Rapp. Soc. Hist. Nat. Maur.* (1826, 1829) ex Boj. *Hort. Maur.* 170.—*Lecontea* Rich. *Rub.* 115, t. 10, fig. 1.—DC. *Prodr.* iv. 470.—Endl. *Gen.* n. 3181.—B. H. *Gen.* ii. 134, n. 288.

large, very various in form. (*Trop. regions of Asia and Oceania, America, east. Africa and islands.*[1])

IV. COFFEEÆ.

30. **Coffea** L. — Flowers hermaphrodite, 2-morphous, regular, generally 4, 5-merous; receptacle concave obovate or oblong. Calyx 5-dentate or lobate, sometimes subentire, short or subnil, often glandular and waxy. Corolla funnel-shaped or hypocrateriform; tube straight or curved, short or elongate; throat glabrous or villose, sometimes densely barbate (*Lachnostoma*); lobes oblong, contorted, finally patent. Stamens 4, 5, inserted in throat, 2-morphous; filaments rather long, short or very short; anthers dorsifixed, enclosed or exserted, finally often contorted or recurved; cells linear introrse, longitudinally rimose. Germen inferior, 2-celled; disk epigynous rather thick; style various 2-morphous, branches subulate or filiform (*Lachnostoma*). Ovules in cells solitary amphitropous; hilum ventral; micropyle extrorsely inferior; placenta more or less dilated around front of ovule and below sometimes more or less thickened to an obturator. Fruit drupaceous, globose or oblong; pyrenes 1, 2, chartaceous, coriaceous or woody, face flat or rather concave and longitudinally sulcate or intruded. Seed conformed to putamen, flat or convex within; margins sometimes incurved or involute; albumen copious horny; embryo eccentric, dorsal to base of albumen and more or less incurved; cotyledons foliaceous, elliptical or cordate; radicle rather long inferior.— Fruit glabrous or more rarely pubescent; leaves opposite or 3-nate, membranous or coriaceous, penninerved entire, petiolate or subsessile; stipules inter- or intrapetiolar more or less connate acuminate, ceraceo-glanduliferous within; flowers axillary cymose; cymes variously compound or contracted; bracteoles sometimes connate in a calycule. (*Asia, Oceania and trop. cont. and ins. Africa.*)—See p. 275.

31 ? **Leiochilus** Hook. f.[2]—Flowers of *Coffea*, 5, 6-merous; calyx

[1] Spec. about 12. Wall. *Pl. As. Rar.* t. 165, 545.—Benth. *Fl. Hongk.* 161.—Hance, *Trim. Journ. Bot.* (1878) 228.—H. Bn. *Adansonia*, xii. 233, n. 194.—Hook. *Fl. Ind.* iii. 153. —Griff. *Notul.* iv. 267, t. 479.—Hiern, *Fl. Trop. Afr.* iii. 228 (*Siphomeris*).—Bak. *Fl. Maur.* 153.—Miq. *Fl. Ind.-Bat.* ii. 257; Suppl. 221,

[2] *Gen.* ii. 116, n. 241.

truncate. Corolla tubular at base; throat glabrous; lobes of limb closely contorted. Stamens 5, 6, inserted in tube; filaments very short; anthers dorsifixed; connective thick, convex on both sides; cells linear submarginal adnate introrse. Germen 2-celled (of *Coffea*); disk epigynous broad; style branches 2, at apex perceptibly dilated shortly and obtusely conical. Fruit oblong-obconical coriaceous, 1, 2-celled; seed adnate to septum oblong; embryo . . . ?—A glabrous shrub; ramules thick, resiniferous to apex; leaves opposite oblong obtuse, petiolate coriaceous reticulately veined; stipules interpetiolar obtuse connate in sheath; flowers [1] in axillary very shortly pedunculate cymes; pedicels short; bracts obtuse resiniferous.[2] (*Madagascar.*[3])

32 ? **Psilanthus** Hook. f.[4]—Flowers nearly of *Coffea;* calycinal teeth 5, persistent and accrete in a lanceolate foliole. Tube of hypocrateriform corolla long slender; lobes 5, oblong, contorted. Stamens 5, inserted at mouth of corolla; anthers sessile dorsifixed elongate, semi-exserted; connective produced in a claw beyond cells. Germen 2-celled; disk thick; branches of slender style 2, narrow obtuse. Ovule &c. of *Coffea.* Fruit crowned with foliaceous calyx, oblong, drupaceous; flesh scanty; endocarp hard; seeds . . . ?—A glabrous shrub; leaves opposite coriaceous oblong-acuminate; petiole short; stipules intrapetiolar acute; ramules to leaves ceraceo-resiniferous; flowers[5] axillary solitary, calyculate.[6] (*Fernando-Po.*[7])

33. **Ixora** L.[8]—Flowers generally 5-merous, more rarely 4–6-merous (nearly of *Coffea*); calyx various, sometimes entire (*Myonyma*[9]), or deciduous (*Rutidea*[10]). Corolla often hypocrateriform; tube slender or rather broad, short or more or less elongate, sometimes very long; lobes contorted; throat bare or barbate. Stamens 4–6, inserted in

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[1] Very small; fruit very small.

[2] Rather a sect. of *Coffea ?*

[3] Spec. 1. *L. resinosus* Hook. f. *loc. cit.*

[4] *Icon.* t. 1129; *Gen.* ii. 115, n. 239.

[5] Large (in 2 doubtful species terminal; corolla (white ?) about 2 inches long and broad.

[6] A sect, of *Coffea ?* Affinities with *Belonophora* indicated by one author.

[7] Spec. 1. *P. Mannii* Hook. f. 2 more doubtful (Hiern, *Fl, Trop, Afr.* iii. 186).

[8] *Gen.* (ed. 1737) 55, n. 131.—J. *Gen.* 203; *Mém. Mus.* vi, 375.—Gærtn. *Fruct.* i. 117, t. 25.—DC. *Prodr.* iv. 485.—Turp. *Dict. Sc. Nat.* Atl. t. 100.—Endl. *Gen.* n. 3161.—B. H. *Gen.* ii. 113, n, 235.—H. Bn. *Adansonia,* xii. 213.—Baker, *Fl. Maurit.* 151.—Hook. *Fl. Ind.* iii. 137.—*Eumachia* DC. *loc. cit.* 478.—? *Pancheria* (erroneously for *Pancheria*) Montrouz. *Mém. Acad. Lyon,* x. 223 (ex B. H.).—*Charpentiera* Vieill. *Pl. N.-Caled.* (1865) 16.

[9] Commers. ex J. *Gen.* 206.—Lamk. *Ill.* t. 68, fig. 1, 2.—Gærtn. f. *Fruct.* iii. t. 195.—Rich. *Rub.* 131.—DC. *Prodr.* iv. 463.—Endl. *Gen.* n. 3203.—B. H. *Gen.* ii. 115, n. 240 (part).—H. Bn. *loc. cit.* 214.—Baker, *Fl. Maurit.* 150.

[10] DC. *Ann. Mus.* ix. 219; *Prodr.* iv. 495.—Rich. *Rub.* 99.—B. H. *Gen.* ii. 116, n. 242.—H. Bn. *Adansonia,* xii. 215.—*Rytidea* Spreng. *Syst.* i. 545.—Endl. *Gen.* n. 3155.—Baker, *Fl. Maurit.* 149.

throat or mouth of corolla; anthers various, exserted or enclosed, sometimes sessile, introrsely ramose. Germen 2- or more rarely 3, 4-celled (*Myonyma*); style various, oftener exserted, at apex fusiform subentire or sulcate (*Rutidea*, *Pavetta*,[1] *Chomelia*[2]); lobes 2 or 2–4 (*Myonyma*); sometimes free, patent or recurved (*Euixora*[3]). Ovules in cells either solitary ascending with micropyle extrorsely inferior or inserted at middle, sometimes rarely descending (*Siderodendron*[4] part) with micropyle introrsely superior; or 2–∞ (*Chomelia*, *Enterospermum*[5]); placenta produced around ovule or ovules and with depressions equal in number to that of ovules. Fruit baccate or oftener drupaceous; pyrenes generally 2, more or less thick, 1–∞-spermous. Seeds descending or oftener ascending; albumen copious, equable or more rarely (*Rutidea*, *Enterospermum*) deeply ruminate and divided into radiating wedge-shaped segments.—Small trees or shrubs, sometimes climbing, often nigrescent on decaying (*Enterospermum*); leaves opposite or rarely verticillate, petiolate or sessile; stipules interpetiolar various, persistent or deciduous; flowers[6] terminal or more rarely axillary, lateral or inserted in wood of branches, generally crowded, very rarely few, in more or less compound corymbiform or umbelliform cymes; cymes often aggregate in a raceme; pedicels bracteolate or ebracteolate; bracteoles sometimes connate in a cupule. (*All trop. regions.*[7])

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[1] L. *Gen.* (ed. 1737) n. 132.—J. *Gen.* 203.—Gærtn. *Fruct.* i. 116, t. 25.—Rich. *Rub.* 100 (part).—DC. *Prodr.* iv. 490 (part).—Spach, *Suit. à Buffon*, viii. 445.—Endl. *Gen.* n. 3160.—B. H. *Gen.* ii. 114, 1229, n. 236.—Hook. *Fl. Ind.* iii. 149.—*Crinita* Houtt. *Pfl. Syst.* vii. 361, t. 40, fig. 1 (1773).—*Baconia* DC. *Prodr.* iv. 485; *Ann. Mus.* ix. 219.—*Verulamia* DC. ex Poir. *Diet.* viii. 543 (1808). Bracteoles inserted at greater or less height on the pedicel, not, as is generally the case in the *Euixoras*, at the base of the germen; but this unimportant character is certainly not constant.

[2] L. *Gen.* (1737) 55 (not Jacq.).—H. Bn. *Adansonia*, xii. 214.—*Tarenna* Gærtn. *Fruct.* i. 139, t. 28 (1788).—*Webera* Schreb. *Gen.* 794 (1791).—B. H. *Gen.* ii. 86, n. 162.—Baker, *Fl. Maurit.* 139.—Hook. *Fl. Ind.* iii. 101.—*Ceriscus* Nees, *Flora* (1825), 116.—*Stylocoryne* Wight and Arn. *Prodr.* 400 (not Cav.).—*Cupia* DC. *Prodr.* iv. 393 (part).—*Wahlenbergia* Bl. *Cat. Buit.* 14 (not Schrad.).—*Coptosperma* Hook. f. *Gen.* ii. 86 (part).

[3] *Ixora* of authors.

[4] Schreb. *Gen.* 71.—Rich. *Rub.* 103, t. 6, fig. 3.—DC. *Prodr.* iv. 478.—Endl. *Gen.* n. 3171.—H. Bn. *Bull. Soc. Linn. Par.* n. 28.—*Sideroxyloides* Jacq. *Amer.* 19, t. 175, fig. 9.

[5] Hiern, *Fl. Trop. Afr.* iii. 92 (1877); *Hook. Icon.* t. 1269.—H. Bn. *Adansonia*, xii. 215.

[6] White, greenish, bluish, coccineous, pink or purple, often sweet scented.

[7] Spec. about 200, a few of which are new-world. Bl. *Bijdr.* 951 (*Pavetta*).—Wight and Arn. *Prodr.* i. 427.—Wight, *Icon.* t. 148–151, 153, 184–186, 318, 584, 706–711, 827, 1035, 1065, 1066 (*Stylocoryne*).—Griseb. *Fl. Brit. W.-Ind.* 337.—M. Arg. *Flora* (1875), 453.—Harv. and Sond. *Fl. Cap.* iii. 4 (*Stylocoryne*), 19 (*Pavetta*).—Bak. and Balf. f. *Fl. Maur.* 149 (*Rutidea*), 150 (*Myonyma*), 151.—Kl. *Pet. Moss. Bot.* 289 (*Pavetta*).—Hiern, *Fl. Trop. Afr.* iii. 88 (*Tarenna*), 162, 167 (*Pavetta*), 187 (*Rutidea*).—Miq. *Fl. Ind.-Bat.* ii. 202, 354 (*Stylocoryna*), 262, 356 (*Pavetta*), 300 (*Myonyma*); Suppl. 546 (*Pavetta*); *Ann. Mus. Lugd.-Bat.* iv. 191.—Seem. *Fl. Vit.* 133.—Benth. *Fl. Austral.* iii. 412 (*Webera*), 413; *Fl. Hongk.* 156 (*Stylocoryne*), 157 (*Pavetta*), 158.

34 ? **Strumpfia** Jacq.[1]—Flowers hermaphrodite; receptacle obovoid. Calyx 5-fid; lobes rather acute; teeth[2] interposed as many or 0. Corolla shortly and broadly funnel-shaped; lobes 5, deep, slightly imbricate. Stamens 5; filaments 1-adelphous,[3] connate in a tube inserted at bottom of corolla, presently dilated ovoid and at apex (of connectives) 5-crenate; anthers[4] adnate within dilated tube, introrse, 2-rimose. Germen inferior, 2-celled, crowned with small epigynous disk; style slender simple, at base attenuate subcontorted, longitudinally hirsute, at apex stigmatose truncate. Ovules in cells solitary erect; micropyle extrorsely inferior. Fruit drupaceous, at apex umbilicate; putamen 1, 2-celled; albumen of oblong seed fleshy; radicle of axile embryo terete inferior; cotyledons rather broad.—A 3-chotomous branched shrublet; branchlets closely articulated; leaves[5] 3-nately verticillate linear rigid, revolute at margin; stipules small interpetiolar; flowers[6] in racemes terminal or axillary to the upper leaves, bracteate and 2-bracteolate. (*Mar. Antilles.*[7])

V. URAGOGEÆ.

35. **Uragoga** L.—Flowers hermaphrodite or more rarely polygamous, 5-merous or more rarely 4–6-merous, receptacle short concave obconical, ovoid or obovoid, enclosing adnate germen. Calyx various, short or large, entire, dentate or lobate, deciduous or more rarely persistent and accrete; lobes often ciliate, rarely pinnatisect. Corolla tubular, funnel-shaped, subcampanulate or subrotate; tube short or long, straight or more rarely curved; throat glabrous, pilose or barbate; lobes 4–6 or more rarely 7–8, valvate, often incurved at apex, sometimes subcucullate or with a dorsal horn. Stamens same in number, inserted at various height in throat or tube; filaments short or rather long; anthers enclosed or exserted; cells introrse, rarely marginal, rimose; connective sometimes thickened at back. Germen inferior, 2-celled or more rarely 3–8-celled; disk epigynous various,

—F. Muell. *Fragm.* ix. 182.—Bedd. *Ic. Pl. Ind. Or.* i. t. 97; 98–100 (*Pavetta*).—Thw. *Enum. Pl. Zeyl.* 154, 155 (*Pavetta*).—Kurz, *For. Fl. Brit. Burm.* ii. 15, 46 (*Webera*).—H. Bn. *Adunsonia*, xii. 294,—*Bot. Reg.* t. 119 (*Stylocoryne*), 198 (*Pavetta*).—*Bot. Mag.* t. 3580 (*Pavetta*), 4191, 4332, 4399, 4482, 4513, 4523, 4586, 5197.—Walp. *Rep.* ii. 480 (*Pavetta*), 481, 484 (*Siderodendron*), 516 (*Stylocoryne*), 942 (*Pavetta*); vi, 45 (*Pavetta*); *Ann.* i. 373, 380 (*Stylocoryne*); ii. 753 (*Pavetta*), 754, 792 (*Stylocoryne*); v. 111, 134 (*Stylocoryne*).

[1] *St. Amer.* 218.—Lamk. *Ill.* t. 731.—Poir. *Dict.* vii. 474.—Pers. *Syn.* 211 (*Strumphia*).—A. Rich. *Rub.* 138, t. 19.—DC. *Prodr.* iv. 469.—Endl. *Gen.* n. 3218.—B. H. *Gen.* 117, n. 245.

[2] Stipules.

[3] Like some *Meliaceæ*.

[4] Nearly of *Compositæ*.

[5] Nearly of *Rosmarinus*.

[6] Minute, white ?

[7] Spec. l. *S. maritima* Jacq.—L. *Spec.* ii. 1316.—W. *Spec.* 1152.—Griseb. *Fl. Brit. W.-Ind.* 336.

entire or lobed; branches of enclosed or exserted style 2, or more rarely 3–8, very various in form. Ovules in cells solitary, erect, anatropous, often compressed back and front; micropyle extrorsely inferior. Fruit drupaceous; exocarp fleshy or finally subdry; pyrenes very various in form, often longitudinally costate at back, sometimes narrow-winged; face flat, convex or concave, sometimes enlarged with spurious cellules; columella various or 0. Seed conformed to pyrenes; albumen copious fleshy or horny, equable or more rarely ruminate; cotyledons of (oftener small) embryo narrow or rather broad; radicle inferior.—Shrubs, or more rarely small trees, undershrubs or herbs, rarely climbing, sometimes epiphytal; leaves opposite or rarely verticillate; stipules interpetiolar or oftener intrapetiolar, free or connate, sometimes plurisetose, rarely widely membranous; flowers rarely axillar, most frequently terminal solitary, glomerulate or cymose; cymes often in compound racemes or collected in a spurious capitule; bracts involucrant sometimes foliaceous or coloured. (*All trop. and warm regions.*)—See p. 280.

36 ? **Mesoptera** Hook. f.[1]—Flowers (nearly of *Uragoga*) 5-merous; calyx short dentate. Corolla shortly tubular, valvate. Stamens 5, inserted in throat; anthers apiculate. Disk epigynous orbicular. Germen 2-celled; ovule in cells 1, ascending; funicle short; micropyle extrorsely inferior. Style short; "stigma large capitately 10-lobed. Fruit sub-2-dymous, 2-coccous; cocci . . . ?" Other characters of *Uragoga*.[2]—A robust tree; leaves opposite, petiolate large ovato-elliptical coriaceous, glossy above, dark-tomentose beneath; stipules broad aliform; flowers[3] in dense axillary "ebracteolate" cymes. (*Malacca.*[4])

37. **Thiersia** H. Bn.[5]—Flowers (nearly of *Uragoga*) 4-merous; receptacle ovoid. Calyx short subentire or sinuate-dentate.[6] Corolla narrow tubular, slightly pubescent within; lobes of slightly dilated limb 4, valvate. Stamens 4, inserted in throat; filaments very short; anthers oblong subenclosed, introrsely 2-rimose. Germen 2-celled; disk epigynous highly conical; branches of enclosed style 2, short obtuse, stigmatose within. Ovule in cells 1; micropyle extrorsely inferior. Fruit . . . ?—A tree (?); branches ancipitous-compressed; leaves opposite oblong penninerved dentate, unequal at base; stipules

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[1] *Gen.* ii. 130, n. 277.—Hook. *Fl. Ind.* iii. 136.
[2] Of which perhaps only a sect. style 10-lobed?
[3] Minute.
[4] Spec. 1. *M. Maingayi* Hook. f. *loc. cit.*
[5] *Adansonia*, xii. 335.
[6] After anthesis somewhat accrescent.

and bracts ciliate; flowers in contracted compound axillary cymes; cymules each 2- or oftener 3-flowered, 4-bracteate; 2 bracts dilated at base, at apex cuspidate subspinescent; 2, alternating with the above, widely membranous (coloured ?) cucullately concave veined.[1] (*French Guiana.*[2])

38. **Declieuxia** H. B. K.[3]—Flowers 4-merous; receptacle externally orbicular-compressed or obcordate. Folioles of calyx 2 (*Congdonia*[4]), or 4, free or more or less connate, equal, or 2 lateral much larger, persistent. Lobes of funnel-shaped corolla 4, valvate; throat variously covered. Stamens 4; filaments slender, inserted in throat; anthers oblong, often exserted, versatile, introrsely 2-rimose. Germen inferior, 2-celled, much compressed contrary to septum; epigynous disk rather thick, very small or 0; branches of slender style 2, thin, exserted, papillose throughout. Ovules in cells solitary ascending; micropyle extrorsely inferior.[5] Fruit subdidymous, finally dry or with a slightly fleshy exocarp; raphe of suberect compressed seed ventral or lateral; albumen fleshy; radicle of small embryo inferior.—Branched shrublets or herbs, glabrous or scaberulous; leaves opposite or more rarely verticillate, petiolate or sessile, coriaceous, venose, sometimes cordate; stipules short setiferous or 0; flowers[6] in scorpioid-cymose branches of terminal inflorescence 1-lateral, 2-bracteolate or ebracteolate.[7] (*Cent. and trop. America.*[8])

39. **Lasianthus** Jack.[9]—Flowers hermaphrodite or 1-sexual (nearly of *Uragoga*), 4–6-merous; lobes of funnel-shaped, hypocrateriform or subcampanulate corolla valvate. Stamens 4–6, inserted in throat of corolla or between lobes; anthers enclosed or subexserted, more rarely in male flower much exserted (?*Allœophania*[10]). Germen 2-celled (*Saldinia*[11]) or 4–10-celled (*Allœophania, Eulasianthus*); disk

[1] Younger flowers of cymule axillant.

[2] Spec. 1. *T. insignis* H. Bn. (referred to *Sabicea* by Naudin, but certainly differing by its solitary ovule).

[3] *Nov. Gen. et Sp.* iii. 352, t. 281.—Rich. *Rub.* 113.—DC. *Prodr.* iv. 479.—Endl. *Gen.* n. 3169. —B. H. *Gen.* ii. 126, n. 268.—*Psyllocarpus* Pohl (ex Endl.).

[4] M. Arg. *Flora* (1876), 437.

[5] Funicle in *D. cærulea* a little longer and inserted a little higher, girt at base with unequal papillæ (ovules being abortive ?).

[6] Small or very small.

[7] A genus somewhat analogous to *Mitreola* among the *Hedyotideas.*

[8] Spec. about 20. Mart. et Zucc. *Ræm. et Sch. Mantiss.* iii. 111.—Cham. et Schltl. *Linnæa*, iv. 4.—Gardn. *Hook. Lond. Journ.* Feb. 1845.—M. Arg. *Flora* (1876), 433.—Walp. *Rep.* ii. 483; vi. 46; *Ann.* ii. 756.

[9] *Trans. Linn. Soc.* xiv. 125.—Bl. *Bijdr.* 995. —Rich. *Rub.* 130.—B. H. *Gen.* ii. 129, n. 272. —Hook. *Fl. Ind.* iii. 178.—*Mephitidia* Reinw. ex Bl. *Bijdr.* 995.—Endl. *Gen.* n. 3190.—DC. *Prodr.* iv. 452.—*Octavia* DC. *Prodr.* iv. 464.—Endl. *Gen.* n. 3205.

[10] Thw. *Enum. Pl. Zeyl.* 147.—B. H. *Gen.* ii. 129, n. 273.—Hook. *Fl. Ind.* iii. 48.—*Hedyotis* of authors.

[11] Rich. *Rub.* 126.—DC. *Prodr.* iv. 483.—Endl. *Gen.* n. 3165.—B. H. *Gen.* ii. 129, n. 274.

epigynous various; style branches equal to number of cells. Ovules &c. of *Uragoga*. Fruit drupaceous, 1–10-pyrenous; flesh sometimes scanty; seeds ascending albuminous.— Shrubs or shrublets (often fœtid), glabrous or oftener scabrous, tomentose or oftener strigose; leaves opposite obliquely or transversely nerved; stipules interpetiolar various, often broad, deciduous or persistent; flowers [1] cymose in axils of leaves, shortly pedicellate or oftener glomerulate crowded.[2] (*Trop. Asia, Oceania, Africa and America.*[3])

40. **Saprosma** Bl.[4]—Flowers nearly of *Lasianthus;* calyx 4–6-lobed or dentate. Lobes of funnel-shaped or subcampanulate corolla oftener 4, valvate; margins attenuate or crispate induplicate. Stamens 4, germen 2-celled, 2-ovulate, &c. of *Lasianthus*. Fruit [5] 2-pyrenous; seeds albuminous.—Glabrous or more rarely pubescent (fœtid) shrubs; leaves opposite or rarely verticillate; stipules interpetiolar, deciduous, 1–3-cuspidate; flowers [6] axillary and terminal, glomerate or cymose, solitary or 3-nate; bracteoles generally connate in calycule.[7] (*Trop. Asia and Oceania.*[8])

41 ? **Myrmecodia** Jack.[9]—Flowers (nearly of *Uragoga*) hermaphrodite, 4-merous; calyx often subentire truncate; corolla funnel-shaped, hypocrateriform or suburceolate, valvate. Stamens 4; anthers subsessile. Fruit drupaceous; flesh oftener scanty; pyrenes 2, plano-convex (*Hydnophytum* [10]) or 3–5, 3-gonal. Other characters of *Uragoga*.[11]—Glabrous epiphytal shrubs, slightly fleshy or coriaceous;

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[1] Small, white, yellow, greenish or pale purple.

[2] A genus, by the intervention of *Allœophania*, closely allied to the *Oldenlandiæ* (if not to the axilliflorous *Uragogis*).

[3] Spec. about 75. Poir. *Dict.* iv. 315 (*Morinda*).—Wight, *Icon.* t. 1032.—Griseb. *Cat. Pl. Cub.* 124 (*Sabicea*).—Miq. *Fl. Ind.-Bat.* ii. 314; Suppl. 548.—Benth. *Fl. Austral.* iii. 425; *Fl. Hongk.* 160.—Bedd. *Ic. Pl. Ind. Or.* t. 9, 13, 21, 22; *Fl. Sylv. Madr.* cxliv-10, t. 17, v.—Thw. *Enum. Pl. Zeyl.* 145 (*Mephitidia*).—Kurz, *For. Fl. Brit. Burm.* ii. 30.—Hiern, *Fl. Trop. Afr.* ii. 228.—H. Bn. *Adansonia*, xii. 232.—Walp. *Rep.* vi. 49; *Ann.* ii. 759.

[4] *Bijdr.* 956.—Rich. *Rub.* 98.—DC. *Prodr.* iv. 493.—Endl. *Gen.* n. 3159.—B. H. *Gen.* ii. 131, n. 278.— Hook. *Fl. Ind.* iii. 192.— *Dysosmia* Miq. *Fl. Ind.-Bat.* ii. 325.— *Dysodidendron* Gardn. *Calc. Journ. Nat. Hist.* vii. 56.

[5] Small, purplish.

[6] Small, white or yellow.

[7] Often denticulate. A genus hence very near *Lasianthus*, thence to *Serissa* and *Hamiltonia*.

[8] Spec. 7, 8. Wall. *Roxb. Fl. Ind.* (ed. Carey) ii. 517 (*Pæderia*).—Miq. *Fl. Ind.-Bat.* ii. 302; Suppl. 223.—Bedd. *Icon. Pl. Ind. Or.* i. t. 14–17, iv. (*Serissa*); *Fl. Sylv. Madr.* cxxxiv–11.—Korth. *Ned. Kruidk. Arch.* ii. 224.—Thw. *Enum. Pl. Zeyl.* 150 (*Serissa*).—Kurz, *For. Fl. Brit. Burm.* ii. 28.—Walp. *Rep.* vi. 45; *Ann.* ii. 752.

[9] *Trans. Linn. Soc.* xiv. 122.—Rich. *Rub.* 144. —DC. *Prodr.* iv. 450.—Endl. *Gen.* n. 3184.— B. H. *Gen.* ii. 132, n. 280.—Hook. *Fl. Ind.* iii. 194.—*Lasiostoma* Spreng. (part).

[10] Jack, *loc. cit.* 124.—DC. *Prodr.* iv. 450.— Endl. *Gen.* n. 3185.—B. H. *Gen.* ii. 132, n. 280. —Hook. *Fl. Ind.* iii. 194.

[11] Stigma sometimes more or less distinctly 2-lobed, but sometimes orbicular and ciliato-marginate.

stem short tuberous, echinate or rugose, hollow (and the abode of ants [1]); leaves [2] opposite, sessile or petiolate; [3] stipules interpetiolar, entire, deciduous (*Hydnophytum*) or more or less persistent, 2-fid; flowers [4] axillary solitary, glomerate or cymose.[5] (*Trop. Oceania.*[6])

42. **Gærtnera** Lamk.[7]—Flowers nearly of *Uragoga*, 5-merous; receptacle hardly concave or subcampanulate. Calycinal lobes or teeth 5, sometimes large or accrescent. Tube of corolla more or less elongate, subhypogynously or somewhat perigynously inserted; lobes of various limb 5, valvate. Stamens &c. of *Uragoga;* filaments generally short. Germen quite or in greater part free, 2-celled, ovate, obovate or obcordate; style 2-lobed at apex. Ovules in cells solitary; micropyle extrorsely inferior.[8] Fruit drupaceous subglobose, obovoid, 2-dymous, oblong or rather long fusiform, inserted at bottom of receptacle, free or subfree; putamens 1, 2; albumen of ascending seed copious, fleshy or cartilaginous; radicle of short straight axile embryo inferior.—Trees or shrubs, oftener glabrous; leaves, habit &c. of *Uragoga;* stipules various, often connate sheathing intrapetiolar setose; flowers [9] in terminal compound racemose cymes; inflorescence either very elongate, or contracted subcapituliform.[10] (*Trop. east. ins. and west. Africa; East India.*[11])

43 ? **Pagamea** Aubl.[12]—Flowers nearly of *Gærtnera*, 4, 5-merous; calyx dentate or shortly lobed. Corolla subrotate, deeply 4, 5-lobed, valvate, often densely barbate within. Stamens inserted in throat. Germen free except quite at the base (of *Gærtnera*); cells 2, or more rarely 3–5; style branches same in number papillose. Fruit

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[1] And of various other animals.

[2] With habit of some *Rhizophoreæ*.

[3] Sometimes peltately inserted.

[4] Small, white.

[5] Rather a sect. of *Uragoga* ?

[6] Spec. about 5. Rumph. *Herb. Amb.* vi. 119, t. 55 (*Nidus germinans*).—Spreng. *Syst.* i. 423 (*Lasiostoma*).—Bl. *Bijdr.* 955 (*Hydnophytum*), 1001.—Gaudich. *Freycin. Voy. Bot.* 472, t. 95, 96.—A. Gray, *Proc. Amer. Acad.* iv. 43.—Miq. *Fl. Ind.-Bat.* ii. 308 (*Hydnophytum*), 309; Suppl. 224.—Car. *N. Giorn. Bot. Ital.* iv. 170, t. 1.

[7] *Ill.* ii. 273, t. 167 (not Retz. nor Schreb. nor Roxb.).—Gærtn. f. *Fruct.* iii. 58, t. 191.—DC. *Prodr.* ix. 32, 35.—Boj. *Nouv. Mém. Soc. Helv.* viii. t. 1, 2 (Neuchât. 1847).—Endl. *Gen.* n. 3370.—Bur. *Loganiac.* 57, fig. 35, 36.—Benth. *Journ. Linn. Soc.* i. 111.—B. H. *Gen.* ii. 798, n. 28.—H. Bn. *Bull. Soc. Linn. Par.* 209.—*Andersonia* W. ex Rœm. et Sch. *Syst.* v. 21.—*Fructesca* DC. *Meissn. Gen.* 259; *Comm.* 168.—*Sykesia* Arn. *Nov. Acta Nat. Cur.* xviii. 351.

[8] Hilum generally situated a little below the insertion of the perianth. Hypogyny hence spurious.

[9] White.

[10] Sect. 4 (Endl. *Gen.* Suppl. i. 1395).

[11] Spec. about 20. Wight, *Icon.* t. 1318.—Miq. *Fl. Ind.-Bat.* ii. 382; Suppl. 227, 551.—Bak. *Fl. Maur.* 230.—Thw. *Enum. Pl. Zeyl.* 201.—H. Bn. *Adansonia*, xii. 237, 238.—Walp. *Ann.* iii. 76.

[12] *Guian.* i. 112, t. 44.—Endl. *Gen.* n. 3371.—Bur. *Loganiac.* 57, fig. 37–42.—Benth. *Jour. Linn. Soc.* i. 109.—B. H. *Gen.* ii. 798, n. 29.—H. Bn. *Bull. Soc. Linn. Par.* 210.

drupaceous, ovoid or often obcordate; pyrenes 1–5, 1-spermous; albumen of suberect seed thick sulcately ruminate; radicle of small embryo inferior. Other characters of *Gærtnera*.[1]—Trees or shrubs; leaves opposite, entire penninerved, oftener coriaceous; secondary nerves oblique little prominent; flowers[2] in axillary or compound cymiferous capituliform cymes; peduncles sometimes complanate. (*Guiana, north-east. Brazil.*[3])

44 ? **Hymenocnemis** Hook. f.[4]—Flowers (nearly of *Uragoga*) hermaphrodite, 4-merous; cells of inferior germen 2, 1-ovulate (of *Uragoga*). Calyx 4-phyllous; folioles unequal various in form, obtuse patent; teeth[5] minute interposed. Corolla funnel-shaped-hypocrateriform; lobes 4, sublanceolate, valvate; "margins subcrispate induplicate." Stamens 4, enclosed; connective shortly produced. Disk epigynous crenulate. Style slender; branches 2, recurved. Fruit . . . ?—A slender divaricately ramose pubescent shrub; leaves opposite (small) ovato-elliptical apiculate, very shortly petiolate; stipules connate in a membranous villose sheath covering the top of the branchlet and finally opening above; flowers[6] axillary solitary; peduncle short bracteolate.[7] (*Madagascar.*[8])

45 ? **Fergusonia** Hook. f.[9]—Flowers hermaphrodite, 4-merous (nearly of *Uragoga* or *Lasianthus*); sepals ovato-lanceolate, ciliate, persistent. Throat of funnel-shaped corolla glabrous and lobes 4, ciliate at apex, valvate. Stamens 4, inserted in throat; filaments short; anthers dorsifixed introrse. Germen inferior; cellules 4, 1-ovulate (of *Uragoga*); disk 4-lobed; "style branches 2, linear, hirsute, sometimes connate." Fruit 4-coccous; cocci subangular; each crowned with a sepal; seeds densely albuminous &c. of *Uragoga*. —A procumbent ramose scabrid herb;[10] branches 4-gonal, radicant below and ciliate at nodes; leaves opposite lanceolate acuminate venose; stipules lanceolate connate, persistent; flowers[11] axillary subsessile, 2-bracteolate.[12] (*East India.*[13])

[1] Of which perhaps rather an American sect.

[2] Small, white.

[3] Spec. about 8. Prog. *Mart. Fl. Bras.* vi. 285, t. 81.

[4] *Gen.* ii. 132, n. 283.

[5] Stipular (?).

[6] Rather large, white (?).

[7] A genus scarcely distinct from and perhaps a sect. of *Uragoga*, from its solitary axilar flower analogous to some south-Caledonian species.

[8] Spec. 1. *H. madagascariensis* Hook. f. *l. c.*

[9] *Icon.* t. 1124; *Gen.* ii. 133, n. 84.—Hook. *Fl. Ind.* iii. 48.

[10] With the habit of *Spermacoce*, to which the genus is certainly closely allied.

[11] Minute, greenish (?).

[12] A genus very near to *Hedyotis* and especially to *Alleophania*, being similar in habit and in character of leaves. Germen cells perhaps 2-ovulate; a spurious septum being interposed between the 2 ovules of the same cell.

[13] Spec. 1. *F. tetracocca.*—*F. Thwaitesii* Hook. f.—*Borreria tetracocca* Thw. *Enum. Pl. Zeyl.* 442.—Bedd. *Ic. Pl. Ind. Or.* t. 39.

46. **Coussarea** Aubl.[1]—Flowers generally 4-merous (nearly of *Uragoga*); cells of germen 2, often incomplete above or nearly to base; septum short or 0. Calyx short entire or dentate (*Faramea*[2]), or cupular (*Eucoussarea*[3]), rarely larger membranous (*Homaloclados*[3]). Lobes of corolla short or elongate; margins more or less thick, valvate. Ovules suberect, free or dorsally more or less connate with base of septum (*Eucoussarea*). Fruit fleshy or coriaceous &c. of *Uragoga*.[4]—Trees, shrubs or undershrubs, sometimes subscandent; branches sometimes compressed or 4-gonal; leaves opposite, oftener glabrous entire; stipules intrapetiolar generally connate in a sheath; flowers[5] terminal in ramose-compound, sometimes corymbiform or capituliform cymes. (*Trop. America.*[6])

VI. MORINDEÆ.

47. **Morinda** Vaill.— Flowers hermaphrodite or more rarely polygamous; receptacle saclike, enclosing adnate germen and externally connate with receptacles of adjacent flowers. Calyx superior gamophyllous, entire, sometimes very short or more or less deeply sinuate, dentate or lobed. Corolla funnel-shaped, hypocrateriform or subcampanulate, sometimes almost quite dialypetalous (*Chorimorinda*); folioles of stamens by means of filaments coalescent; lobes of more or less expanded limb 4, 5, more rarely more, rather thick, valvate. Stamens as many alternate; filaments short or elongate, inserted at bottom of tube or on receptacle either free from throat or coadnate

[1] *Guian.* i. 98, t. 38 (not of others).—J. *Gen.* 203.—Lamk. *Ill.* t. 65.—Rich. *Rub.* 97, t. 8, fig. 1, 2.—DC. *Prodr.* iv. 493.—Endl. *Gen.* n. 3158.—B. H. *Gen.* ii. 120, 1229, n. 256.—*Frœlichia* Vahl, *Eel. Præf.* 3 (not Mœnch, nor Wulf.).—*Billardiera* Vahl, *Ecl.* i. 13, t. 10, fig. 3 (not Mœnch. nor Sm.).—*Pecheya* Scop. *Introd.* 143.

[2] Aubl. *Guian.* 102, t. 40.—J. *Gen.* 209; *Mém. Mus.* vi. 376.—Lamk. *Ill.* t. 63.—Rich. *Rub.* 95, t. 7, fig. 1, 2.—DC. *Prodr.* iv. 496.—Endl. *Gen.* n. 3154.—B. H. *Gen.* ii. 121, 1229, n. 257.—*Tetramerium* Gærtn. f. *Fruct.* iii. 90, t. 196.—*Potima* Pers. *Syn.* i. 209.—? *Darluca* Rafin. *Ann. Gén. Sc. Phys.* vi. 87 (ex DC.).

[3] Hook. f. *Icon.* t. 1128 (*Omaloclados*).—B. H. *Gen.* ii. 122, n. 258.

[4] From which the genus is too artificially distinct; the interlocular septum is certainly sometimes complete.

[5] Small or oftener rather large, not unhandsome, white, often fragrant.

[6] Spec. about 60. R. et Pav. *Fl. Per.* t. 214, 215 (*Coffea*).—H. B. K. *Nov. Gen. et Sp.* iii. t. 287 (*Tetramerium*).—Pœpp. et Endl. *Nov. Gen. et Sp.* i. 231 (*Coussarea*), 234, sinistr.—Jacq. *St. Amer.* 67, t. 47.—Presl, *Symb.* t. 40 (*Faramea*).—Karst. *Fl. Colom.* t. 107 (*Coussarea*).—Griseb. *Fl. Brit. W.-Ind.* 338.—M. Arg. *Flora* (1875), 465, 468 (*Faramea*).—Benth. *Linnæa*, xxiii. 452 (*Faramea*).—Walp. *Rep.* ii. 478 (*Faramea*), 480; vi. 43 (*Faramea*), 44 (?); *Ann.* ii. 750 (*Faramea*, part). *C. Frœlichia* A. Rich. (*Rub.* 97), a plant cultivated in bath-rooms many years ago, is an *Ixora*.

with alternate lobes of corolla; anthers dorsifixed, enclosed or exserted, introrsely 2-rimose. Germen 2-celled; disk epigynous various; style branches 2, short or elongate narrow stigmatose. Ovules in cells 1, or 2, inserted at various height on the septum, ascending, more or less completely anatropous; micropyle extrorsely inferior or finally lateral; in 2-ovulate cells, a spurious septum more or less prominent between each ovule; cellules sometimes complete. Fruit generally concrete in a fleshy syncarp; putamens 2-locular, 2-locellate, or 1–4 pyrenes for each flower, 1-spermous. Albumen of ascending seed copious fleshy; radicle of more or less elongate axile embryo inferior terete or dilated.—Small trees or shrubs, erect or climbing, sometimes epiphytal; leaves opposite or more rarely verticillate, entire; stipules interpetiolar or intrapetiolar, connate or free, various in form; flowers in a spurious capitule (contracted cymes), sometimes in each inflorescence ∞, more rarely 3 (*Tribrachya*), or 2 (*Dibrachya*), very rarely few or solitary (*Imantina*); capitules axillary or terminal, solitary, 2-nate or spuriously corymbose. (*Trop. regions of both worlds.*)—See p. 291.

48. **Appunia** Hook. f.[1]—Flowers of *Morinda*, 5-merous; germens free. Calyx short, sometimes entire or wide membranous. Corolla elongate; lobes long-acute, thick, valvate. Germen 2-celled; cells 2-ovulate, sometimes spuriously septate between ovules. Ovules &c. of *Morinda*. Fruit free drupaceous, 2–4-pyrenous; pyrenes 1, 2-spermous.—Small trees or shrubs; leaves opposite or "the uppermost rarely subalternate;" stipules interpetiolar; flowers in spurious axillary capitules long-pedunculate, glomerate, few bracteolate.[2] (*Venezuela, Guiana, north east. Brazil.*[3])

49. **Cœlospermum** Bl.[4]—Flowers (nearly of *Appunia* or *Morinda*) 4, 5-merous; calyx truncate or dentate. Corolla funnel-shaped, hypocrateriform or subrotate; lobes valvate, sometimes almost quite

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[1] *Gen.* ii. 120, 1229, n. 254.—*Bellynxia* M. Arg. *Flora* (1875), 465.

[2] A genus differing from *Morinda* only in its flowers not being connate.

[3] Spec. 2–4. Benth. *Hook. Journ. Bot.* iii. 232 (*Coffea*). *Ixora angulata* Spruce (exs. n. 3337), referred to another genus, appears to us a species of *Appunia;* leaves all opposite in the herb. spec. of the Paris Mus.; germens free; cellules 4; ovule in each 1, ascending.

[4] *Bijdr.* (1825–26) 994 (*Cœlospermum*).—Rich. *Rub.* 129.—DC. *Prodr.* iv. 468.—Endl. *Gen.* n. 3211.—B. H. *Gen.* ii. 119, n. 251.—H. Bn. *Bull. Soc. Linn. Par.* 195.—Hook. *Fl. Ind.* iii. 159.—*Olostyla* DC. *Prodr.* iv. 440.—B. H. *Gen.* ii. 66, n. 103.—H. B. *Bull. Soc. Linn. Par.* 183.—*Holostyla* Endl. *Gen.* n. 3225.—*Pogonolobus* F. Muell. *Fragm. Phyt. Austral.* i. 55.—*Trisciadia* Hook. f. *Gen.* ii. 68, n. 111.—Hook. *Fl. Ind.* iii. 94.

free or through the tube a little above the base; throat bare, pilose or barbate. Stamens 4, 5, inserted in throat; anthers dorsifixed, introrse, versatile, sometimes acuminate; cells oftener discrete at base. Germen 2-celled &c. of *Morinda;* ovules in cells 2, ascending; micropyle extrorsely inferior;[1] a spurious septum between each ovule more or less evolved or 0. Fruit drupaceous; putamens generally 4, 1-spermous; coat of albuminous ascending seed rather hard, sometimes produced below to a short membranous wing.—Small trees or shrubs, flexuose or climbing, generally glabrous; branchlets sometimes compressed; leaves[2] opposite coriaceous, often reticulate veined; stipules inter- or intrapetiolar various; flowers[3] in terminal cymes inserted subumbellately on a common axis; bracts sometimes wide membranous;[4] pedicels articulate. (*Trop. Oceania, Australia, N. Caledonia.*[5])

50. **Gynochtodes** Bl.[6]—Flowers hermaphrodite or oftener 1-sexual (nearly of *Cœlospermum*), 4, 5-merous; calyx short entire, sinuate or 5-dentate. Corolla various coriaceous; tube sometimes short; throat pilose; lobes of limb valvate, patent or reflexed. Stamens &c. of *Morinda*. Germen 2-celled; ovules in each cell 2, ascending or more rarely subhorizontal (*Tetralopha*[7]); micropyle extrorsely inferior; disk epigynous rather thick; style sometimes very short (*Tetralopha*). Fruit drupaceous, 2–4-pyrenous; seeds richly albuminous.—Glabrous, sometimes climbing shrubs; leaves opposite coriaceous;[8] stipules connate, sometimes rather large, deciduous; flowers[9] in small pedunculate or sometimes contracted axillary cymes; bracts sometimes (*Tetralopha*) connate in a ring.[10] (*Ind. Archip.*[11])

51. **Cruckshanksia** Hook. and Arn.[12]—Flowers hermaphrodite; receptacle subglobose or shortly ovoid, enclosing adnate germen.

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[1] Sometimes finally lateral.

[2] Often yellow.

[3] Small or rather large, white or pale yellow, mostly sweet-scented.

[4] *C. decipiente* H. Bn. (*Morinda reticulata* Benth.). Germens of this plant free; cells 2-ovulate; each 2-cellulate.

[5] Spec. about 10. Labill. *Sert. Austro-caled.* 48, t. 48 (*Stylocoryna*).—Wall. *Roxb. Fl. Ind.* (ed. Car.) ii. 538 (*Webera*).—DC. *Prodr.* iv. 394, n. 7 (*Cupia*).—Miq. *Fl. Ind.-Bat.* ii. 301, 356.—F. Muell. *Fragm.* v. 19.—Benth. *Fl. Austral.* iii. 424 (*Morinda*, n. 4; *Cœlospermum*).—H. Bn. *Bull. Soc. Linn. Par.* n. 28; *Adansonia*, xii. 236.

[6] *Bijdr.* 993.—Rich. *Rub.* 128.—DC. *Prodr.* iv. 477.—Endl. *Gen.* n. 3210.—B. H. *Gen.* ii. 119, n. 252.—Hook. *Fl. Ind.* iii. 160.

[7] Hook. f. *Icon.* t. 1072; *Gen.* ii. 120, n. 253.

[8] Generally darkening on drying.

[9] Small, white.

[10] A genus closely related to *Cœlospermum*. Cells of germen spuriously septate between ovules in *Eugynochtode;* in *Tetralopha* not septate.

[11] Spec. 3, 4. Miq. *Fl. Ind.-Bat.* ii. 313; *Suppl.* 224, 548.

[12] *Hook. Bot. Misc.* iii. 361.—Endl. *Gen.* n. 3137.—B. H. *Gen.* ii. 97, n. 190.—H. Bn. *Bull. Soc. Linn. Par.* 187.—*Rotheria* Meyen, *Reis.* i. 402.—Walp. *P'. Meyen.* 355.

Calyx gamophyllous; lobes very various in size and form; 1, 2, or more rarely 3 expanded in a venose oftener petiolate and coloured membranous leaf; the rest or more rarely all (*Oreopolus*[1]) shorter unequal, entire or dentate. Corolla hypocrateriform; tube elongate; throat glabrous or pubescent; lobes 4, 5, valvate, finally reflexed. Stamens 4, 5, inserted in throat of corolla; anthers enclosed or semi-exserted. Germen 2-celled; disk epigynous depressed; branches of slender style[2] 2 stigmatose, short revolute. Ovules in cells 2,[3] collaterally ascending; incompletely anatropous; micropyle extrorsely inferior, finally lateral; a spurious incomplete septum[4] sometimes produced between each ovule. Fruit capsular, crowned more or less with accrete calyx; valves 2–4, solute from membranous septum. Seeds ovoid or subcochleate; hilum ventral rather broad; albumen fleshy or hard; cotyledons of curved embryo foliaceous; radicle terete inferior.—Herbs or low undershrubs, branched leafy, erect or creeping, glabrous or oftener sericeous or tomentose; leaves opposite subcoriaceous; stipules persistent more or less connate with petioles in a sheath; flowers[5] in terminal umbelliform or corymbiform cymes; involucrant bracts entire or more or less lobed. (*Chili.*[6])

52. **Carphalea** J.[7]—Flowers (nearly of *Cruckshanksia*) 4, 5-merous; calyx gamophyllous membranous finally accrete subscarious venose (coloured[8]); lobes more or less deep, obtuse, sinuate, or highly subspathulate,[9] equal or unequal; sometimes interspersed by narrow denticules (stipules ?). Lobes of long or very long tubular corolla 4, 5, valvate or induplicate-valvate; throat more or less dilated variously pilose. Stamens 4, 5; filaments slender inserted in throat or free to base of tube (and coadnate with it by means of hairs); anthers enclosed or exserted introrse dorsifixed, generally versatile. Germen 2-celled; disk epigynous small or 0; branches of very slender style 2, exserted, papillose throughout. Ovules in cells 2, 3 (rarely more),

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[1] Schlchtl, *Lechl. Pl. Exs.* n. 2895.—B. H. *Gen.* ii. 97, n. 191.

[2] Dimorphous.

[3] More rarely 3, subcollateral; at apex of placenta free little prominent.

[4] Springing from the placenta sometimes from the wall rarely much developed.

[5] Pale or deeper yellow.

[6] Spec. 5, 6. Pœpp. et Endl. *Nov. Gen. et Sp.* iii. 31, t. 236.—Cl. *C. Gay Fl. Chil.* iii. 192, t. 33.—Walp. *Rep.* ii. 469; *Ann.* i. 984.

[7] *Gen.* 198; *Mém. Mus.* vi. 383.—Lamk. *Ill.* t. 59, fig. 3.—Poir. *Dict.* Suppl. ii. 119.—Rich. *Rub.* 195.—DC. *Prodr.* iv. 413.—Endl. *Gen.* n. 3249.—B. H. *Gen.* ii. 52, n. 69.—H. Bn. *Bull. Soc. Linn. Par.* 186.—*Dirichletia* Kl. *Monatsb. Akad. Wiss. Berl.* (1853) 494; *Pet. Moss. Bot.* t. 47, 48.—B. H. *Gen.* ii. 56, n. 80.

[8] Oftener pink or violet.

[9] In *C. madagascariensis* narrow subequal and subfree, but connate at base by means of an annular membrane.

inserted at top of erect placenta at bottom of internal angle, more or less completely anatropous; micropyle extrorsely inferior. Fruit capsular or coriaceous, dehiscing unequally, few-seeded; seeds ascending; albumen . . . ?—Shrubs or undershrubs, erect or ramose; leaves opposite nervose, sometimes linear; stipules cuspidate or setose more or less connate with petioles; flowers in terminal compound corymbiform or more rarely capituliform cymes. (*East. trop. Africa, Madagascar.*[1])

53. **Jackia** WALL.[2]—Flowers nearly of *Carphalea;* receptacle obconical; calyx lobes 3–5, of which 3 are generally larger patent excrescent foliaceous scarious venose; the others much smaller dentiform intermixed. Corolla tube slender; throat pubescent; lobes of limb 5, induplicate-valvate. Stamens 5; anthers subsessile semi-exserted. Germen 2-celled; disk pilose; lobes of very slender style 2 stigmatose, free or connate. Placenta suberect (of *Carphalea*), bearing 2 ovules at apex. Fruit coriaceous, crowned with accrete calyx; seeds 1, 2, erect; albumen . . . ?—A "lofty ramose" tree; leaves (large) opposite oblong- or obovate-lanceolate nervose; petioles short; stipules interpetiolar large sheathing pilose-setose; flowers in long-pedunculate pendulous oppositely branched racemes, subsessile; branches richly cymiferous; cymes secund, 1-parous above; bracts subfoliaceous sub-2-stichous, sometimes connate at base.[3] (*Malaya, Borneo.*[4])

54. **Phyllomelia** GRISEB.[5]—Flowers hermaphrodite; receptacle long obconical. Calyx wide membranous orbicular, scarcely concave above, at margin entire or obtusely lobed, finally accrete above fruit reticulate. Corolla subinfundibular; tube short, somewhat dilated at base; limb 4–6-lobed, imbricate.[6] Stamens same in number, inserted in tube; filaments rather short; anthers at apex broader obtuse, at base 2-fid, finally exserted. Germen inferior, 2-celled; disk depressed-orbicular hispid; style rather thick, divided above into 2 papillose-

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[1] Spec. 8, 9. WALP. *Ann.* v. 107 (*Dirichletia*). —H. BN. *loc. cit.* 188.

[2] *Roxb. Fl. Ind.* (ed. CAR.) ii. 321 (not BL. nor SPRENG.).—RICH. *Rub.* 119.—DC. *Prodr.* iv. 621. —ENDL. *Gen.* n. 3329.—B. H. *Gen.* ii. 99, n. 195. —H. BN. *Bull. Soc. Linn. Par.* 185.—HOOK. *Fl. Ind.* iii. 125.—*Zuccarinia* SPRENG. *Syst. Cur. Post.* 50 (not BL.).

[3] A genus quite agreeing with *Carphalea* in natural characters; flowers nearly and nature of placentation quite the same; differing chiefly in habit and size of parts.

[4] Spec. 1 v. 2 (?). WALL. *Pl. As. Rar.* t. 293. —MIQ. *Fl. Ind.-Bat.* ii. 237; Suppl. 220, 543; *Ann. Mus. Lugd.-Bat.* ix. 135.

[5] *Cat. Pl. Cub.* 139.—B. H. *Gen.* ii. 116, n. 224.

[6] Lobes rather, where 6, 2-seriate; 3 exterior valvate; 3 alternate, interior.

stigmatose revolute branches. Ovule in cells 1, erect elongate. Fruit coriaceous, crowned with calyx; cocci 2, cartilaginous, 1-spermous. Seeds erect "albuminous; cotyledons of axile embryo linear;" radicle inferior.—A glabrous shrub; leaves opposite subobovate; stipules intrapetiolar connate; flowers [1] in pendulous axillary cymes.[2] (*Cuba.*[3])

55. **Retiniphyllum** H. B.[4]—Flowers hermaphrodite; receptacle poculiform or subglobose short, enclosing adnate germen. Calyx tubular gamophyllous, subentire or 5-dentate at apex, persistent. Corolla thick hypocrateriform; tube elongate; lobes of limb 5, much contorted, finally reflexed at top of tube. Stamens 5, inserted within villose throat;[5] filaments thick subulate villose; anthers introrse ovate dorsifixed, acuminate at apex; cells produced at base to a lamina or narrow process, rimose, versatile. Disk epigynous annular or long-produced surrounding base of style; style exserted 5-lobed at apex. Germen inferior, 5–8-celled; ovules in cell 2, incurved, collaterally inserted on little prominent funiculiform placenta; micropyle extrorsely inferior. Drupe 5-pyrenous; pyrenes cartilaginous, 1-spermous. Seed incurved; hilum ventral linear; albumen fleshy; cotyledons of elongate terete embryo short; radicle inferior.—Glabrous or pilose shrubs, often resino-vernicifluous; leaves opposite coriaceous closely nerved; stipules connate in a short sheath; flowers [6] terminal spicate; bracts connate in a cupule or involucel. (*North. Brazil, Guiana.*[7])

VII. CHIOCOCCEÆ.

56. **Chiococca** P. Br.—Flowers hermaphrodite or rarely polygamous; receptacle obconical or obovoid, sometimes costate, enclosing germen in its cavity and bearing the perianth at its margin. Calyx gamophyllous; teeth 5 (more rarely 4 or 6). Corolla funnel-shaped or subcampanulate; throat glabrous; lobes of obtusely 5-gonal limb

[1] "Greenish."

[2] A genus apparently very near the preceding notwithstanding the æstivation of the corolla; cells of germen 1-ovulate.

[3] Spec. 1. *P. coronata* Griseb. *loc. cit.*

[4] *Pl. Æquin.* i. 86, t. 25.—Rich. *Rub.* 128.—DC. *Prodr.* iv. 466.—Endl. *Gen.* n. 3208.—B. H. *Gen.* ii. 98, n. 192.—*Commianthus* Benth. *Hook. Journ. Bot.* iii. 223.—? *Ammianthus* Spruce, *Exs.* n. 2248 (ex Hook. f. *loc. cit.*).

[5] Sometimes inserted at the bottom of the hollows of the corolla.

[6] Moderate, "white or pink."

[7] Spec. 5, 6. H. B. K. *Nov. Gen. et Sp.* iii. 421.—Walp. *Rep.* ii. 488; vi. 50 (*Commianthus*); *Ann.* v. 114 (*Commianthus*).

5, imbricate at attenuate margin. Stamens 5, inserted at bottom of corolla tube and often nearly free from it; filaments connate in a small tube, afterwards free, subulate; anthers dorsifixed at base; cells 2, extrorsely or marginally rimose. Germen generally 2-celled (rarely 3, 4-celled); disk epigynous thick; style slender, at apex stigmatose truncate or slightly dilated, entire or shortly 2-lobed. Ovules in cells solitary, descending; micropyle introrsely superior; funicle short, sometimes dilated to a small obturator over micropyle. Fruit drupaceous compressed, orbicular, obcordate or 2-dymous; exocarp sometimes thin coriaceous; pyrenes 2, chartaceous, 1-spermous. Seed descending, laterally compressed; albumen coriaceous or fleshy; cotyledons of axile embryo ovate or elliptical, often narrow; radicle terete superior.—Erect or climbing shrubs, generally glabrous; leaves opposite petiolate ovate or lanceolate entire coriaceous; stipules rather broad, 3-angular acute, persistent; flowers in simple or compound racemose cymes, often 1-lateral, shortly pedicellate, ebracteate. (*Trop. America.*)—See p. 297.

57 ? **Asemnantha** Hook. f.[1]— Flowers (nearly of *Chiococca*) 4-merous; lobes of oblong-urceolate corolla 4, subvalvate (or imbricate). Stamens 4 (of *Chiococca*); filaments 1-adelphous at base, free above, hirsute; anthers extrorse rimose. Germen 2-celled; ovules of *Chiococca;* style slender, at apex incrassate simple or very shortly 2-sulcate; disk epigynous orbicular very thin. Fruit pubescent . . . ? — A tomentose shrub; leaves opposite small; stipules interpetiolar acute; flowers[2] axillary few cymose; pedicels 2-bracteolate.[3] (*Yucatan.*[4])

58. **Scolosanthus** Vahl.[5]—Flowers (nearly of *Chiococca*) 4-merous; calyx lobes various, persistent. Corolla funnel-shaped; tube straight or curved; throat glabrous; lobes 4, imbricate; 2 interior,[6] sometimes incurved at margin. Stamens 4; filaments inserted at bottom of corolla or on the receptacle itself, connate in a short tube below, often puberulous; anthers basifixed or subbasifixed sagittate, enclosed; cells extrorsely or marginally rimose. Germen 2-celled; disk small or scarcely perceptible; style various, dilated at stigmatose apex, subentire or 2-lobed. Ovules solitary descending; micropyle introrsely

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[1] *Gen.* ii. 106, n. 215.
[2] Small, yellow.
[3] Rather a sect. of *Chiococca ?*
[4] Spec. 1. *A. pubescens* Hook. f. *loc. cit.*
[5] *Ecl.* i. 11, t. 10.— Rich. *Rub.* 125.—DC. *Prodr.* iv. 484.— Endl. *Gen.* n. 3164.—B. H. *Gen.* ii. 107, n. 217.—*Anthacanthus* Rich. (ex Endl.).—*Echinodendrum* Rich. *Fl. Cub.* t. 47bis (ex B. H.).
[6] Sometimes rather narrower than the others.

superior. Fruit drupaceous 1, 2-pyrenous; albuminous seed &c. of *Chiococca*.[1]—Shrubs unarmed or with spinescent ramules; leaves[2] opposite, shortly petiolate, coriaceous, glossy above; stipules small interpetiolar; flowers[3] axillary pedunculate solitary or cymose few. (*Antilles*.[4])

59. **Ceratopyxis** Hook. f.[5]—Flowers 5-merous; lobes of gamosepalous calyx elongately subulate, persistent. Limb of funnel-shaped corolla 5-gonal in the bud; lobes lanceolate, incurved at apex, imbricate, revolute. Stamens 5; filaments inserted at bottom of corolla tube; anthers exserted, affixed near base; cells linear subextrorse. Germen 2-celled; style slender, 2-fid at stigmatose apex. Ovules in cells solitary descending elongate; micropyle introrsely superior. Fruit short, crowned with calyx, coriaceous, pubescent, compressed contrary to septum; seeds oblong albuminous; radicle of axile embryo superior. Other characters of *Chiococca*.[6]—A "resiniferous" shrub; leaves opposite petiolate oblong acuminate coriaceous highly nervose; stipules rather large subulate connate in a sheath, finally solute; flowers[7] in axillary and terminal pedunculate cylindrical densely cymiferous bracteate and sometimes foliate racemes, bracteolate. (*Cuba*.[8])

60. **Machaonia** H. B.[9]—Flowers 4, 5-merous; receptacle oftener oblong, more or less compressed laterally. Calyx various, persistent; lobes 4, 5, oftener unequal, imbricate. Corolla longer or shorter funnel-shaped or subcampanulate; lobes equal or unequal, sometimes very short, slightly or closely imbricate; throat sometimes villose. Stamens 4, 5, inserted in throat; filaments often short; anthers dorsifixed oblong, enclosed or exserted, sometimes short or sub-2-dymous, introrse. Disk epigynous various, sometimes very small, often 2-lobed.[10] Style often incrassate from base to apex; lobes generally 2,[11] short acute slightly recurved. Germen inferior, some-

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[1] To which the genus is very near, as are also *Chione*, *Erithalis* and *Machaonia*.

[2] Often very small.

[3] Small or very small.

[4] Spec. 4, 5. Lamk. *Ill.* t. 67, fig. 2 (*Catesbæa*).—Griseb. *Fl. Brit. W.-Ind.* 335; *Cat. Pl. Cub.* 122 (*Catesbæa*).

[5] *Icon.* t. 1125; *Gen.* ii. 105, n. 210.

[6] To which the genus is very near, hence also to some *Machaonias*.

[7] Small, yellow (?).

[8] Spec. 1. *C. verbenacea* Hook. f.—*Rondeletia ? verbenacea* Griseb.

[9] *Pl. Æquin.* i. 101, t. 29.—Rich. *Rub.* 82.—DC. *Prodr.* iv. 574.—Endl. *Gen.* n. 3135.—B. H. *Gen.* ii. 102, n. 202.—H. Bn. *Bull. Soc. Linn. Par.* 203.—*Schiedea* A. Rich. *Rub.* 106 (not *alior*).—*Tertrea* DC. *Prodr.* iv. 481.—Endl. *Gen.* n. 3168.—B. H. *Gen.* ii. 108, n. 219.—H. Bn. *Bull. Soc. Linn. Par.* 198.—*Microsplenium* Hook. f. *Gen.* ii. 4, n. 4.—H. Bn. *Bull. Soc. Linn. Par.* 203.

[10] One lobe anterior, the other posterior.

[11] Very rarely 3; denticules sometimes 2, with true stigmatiferous branches alternating.

times 3- or generally 2-celled; ovule in cells solitary descending elongate, often pointed below; funicle sometimes rather long continuous with dorsal raphe; micropyle introrsely superior. Fruit oblong or obovoid laterally compressed, crowned with calyx, generally obtusely costate, slightly fleshy; cocci indehiscent, often finally pendulous from columella; albumen of elongate seed often thin; radicle of straight embryo elongate superior.—Trees or shrubs, erect or sarmentose; ramules sometimes spinescent; leaves opposite or more rarely closely packed, petiolate, oblong or ovately elliptical, sometimes small or few; stipules interpetiolar, often 3-angular, sometimes very small; flowers [1] in compound corymbiform and cymiferous generally terminal, sometimes few flowered racemes, often bracteolate. (*Both trop. Americas.*[2])

61 ? **Placocarpa** Hook. f.[3]—Flowers (nearly of *Scolosanthus*) 4- or more rarely 5-merous; sepals linear-subspathulate coriaceous, persistent. Lobes of narrow funnel-shaped slightly incurved corolla obtuse imbricate; throat glabrous. Stamens 4, 5, inserted in throat, enclosed; anthers oblong. Germen 2-celled; branches of slender style 2, recurved stigmatose; disk depressed subentire or 2-lobed. Ovules solitary descending; funicle rather long continuous with dorsal raphe. Fruit subelliptical, compressed contrary to septum; cocci 2, indehiscent; seeds compressed . . . ?—A branched puberulous shrub; leaves small opposite, oblong or obovate, shortly petiolate; stipules small interpetiolar, 3-angular, often dark-apiculate; flowers axillary solitary, 2-bracteolate, or 2, 3, cymose.[4] (*Mexico.*[5])

62. **Erithalis** P. Br.[6]—Flowers 5–10-merous; receptacle subglobose. Calyx gamophyllous, subentire or 5–10-dentate, persistent. Lobes of subrotate or shortly hypocrateriform corolla 5–10, oblong, slightly imbricate only at apex. Stamens 5–10, inserted at bottom of corolla; filaments short or rather long, sometimes connate at base; anthers oblong basifixed, sometimes subexserted, often apiculate.

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[1] Small, white or yellow.

[2] Spec. about 12. H. B. K. *Nov. Gen. et Sp.* iii. 350.—Ch. et Schlchtl, *Linnæa*, iv. 2.—Griseb. *Fl. Brit. W.-Ind.* 348; *Cat. Pl. Cub.* 139.—H. Bn. *Bull. Soc. Linn. Par.* 204.—Walp. *Rep.* vi. 35.

[3] *Gen.* ii. 107, n. 218.

[4] Apparently rather a section of *Machaonia*, inflorescence very poor.

[5] Spec. 1. *P. mexicana* Hook. f. *loc. cit.*

[6] *Jam.* 165, t. 17, fig. 3.—L. *Gen.* n. 238.—J. *Gen.* 206; *Mém. Mus.* vi. 396.—Sw. *Obs.* 80.—Lamk. *Dict.* ii. 388; Suppl. ii. 580 (part); *Ill.* t. 159.—Gærtn. *Fruct.* i. 129, t. 26.—DC. *Prodr.* iv. 465.—Endl. *Gen.* n. 3207.—B. H. *Gen.* ii. 105, n. 209.—*Herrera* Adans. *Fam. des Pl.* ii. 158 (not Pav.).

Germen inferior, 5- 10-celled; cells oppositipetalous, 1-ovulate; disk epigynous depressed; style narrowed at base within disk, at apex rather thick entire sulcate. Ovules descending from top of cell angle; micropyle introrsely superior. Fruit drupaceous; pyrenes 5–10. Seeds descending; funicle sometimes incrassate; albumen fleshy; radicle of small axile embryo superior.—Glabrous shrubs; leaves opposite petiolate coriaceous entire; stipules intrapetiolar connate in sheath; flowers in terminal pedunculate compound cymiferous corymbs. (*Antilles, Florida, Venezuela.*[1])

63. **Chione** DC.[2]—Flowers (nearly of *Erithalis*) 4, 5-merous; calyx dentate or lobed. Corolla short funnel-shaped campanulate; lobes obtuse, sometimes subauriculate at base, closely imbricate. Stamens 4, 5; filaments rather thick inserted above base of corolla; anthers dorsifixed, introrse, 2-rimose. Germen 2-celled; disk epigynous rather thick; branches of thickish style 2, obtuse divaricate. Ovules in cells solitary descending; funicle rather thick; raphe dorsal. Fruit oblong drupaceous; putamen very hard, 2-celled. Seeds cylindrical, pointed below; albumen oftener thin; cotyledons of fleshy macropod embryo small inferior; radicle thick superior.—Glabrous trees or shrubs; leaves opposite entire coriaceous petiolate; stipules ovate, sometimes connate, caducous; flowers[3] in terminal compound sometimes subcorymbose cymes, bracteolate. (*Antilles.*[4])

64. **Guettarda** L.[5]—Flowers hermaphrodite or oftener polygamo-diœcious; calyx cupular, tubular or campanulate, entire or dentate, persistent or deciduous; teeth equal or unequal. Corolla funnel-

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[1] Spec. 4, 5. P. Br. *loc. cit.*—Griseb. *Fl. Brit. W.-Ind.* 336; *Cat. Pl. Cub.* 133 (*Chione*), 134.—Chapm. *Fl. S. Unit. St.* 178.

[2] *Prodr.* iv. 461.—B. H. *Gen.* ii. 107, n. 216.—*Sacconia* Endl. *Gen.* n. 541.—*Crusea* Rich. *Rub.* 124. t. 9, fig. 1 (not DC.).

[3] Small, "whitish."

[4] Spec. 3, 4. Vahl, *Ecl.* iii. t. 21 (*Psychotria*).—Griseb. *Fl. Brit. W.-Ind.* 335; *Cat. Pl. Cub.* 133 (part).

[5] *Gen.* n. 1064.—J. *Gen.* 207.—Rich. *Rub.* 121.—DC. *Prodr.* iv. 455.—Endl. *Gen.* n. 3192.—B. H. *Gen.* ii. 99, n. 196.—Baker, *Fl. Maurit.* 143.—Hook. *Fl. Ind.* iii. 126.—*Matthiola* L. *Gen.* n. 1231 (not DC.).—*Cadamba* Sonn. *Voy.* ii. 228, t. 128 (1776).—*Halesia* P. Br. *Jam.* 205 (1756).—*Antirrhœa* Commers. *J. Ge.* 204; *Mém. Mus.* vi. 377 (*Antirhœa*).—DC. *Prodr.* iv. 459.—Endl. *Gen.* n. 3194.—B. H. *Gen.* ii. 100, n. 197.—Baker, *Fl. Maurit.* 144.—*Stenostomum* Gærtn. f. *Fruct.* iii. 69.—*Sturmia* Gærtn. f. *loc. cit.* t. 192.—*Stenostemum* J. *Mém. Mus.* vi. 377.—*Dicrobotryum* W. ex Sch. *Syst.* v. 221.—*Laugeria* Vahl, *Ecl.* 26, t. 10 (1796).—B. H. *Gen.* ii. 101, n. 198.—*Bobea* Gaudich. *Freycin. Voy. Bot.* 473, t. 93.—B. H. *Gen.* ii. 101, n. 200.—*Bobœa* Rich. *Rub.* 135.—*Guettardella* Champ. *Hook. Kew Journ.* iv. 197.—*Pittoniotis* Griseb. *Bonplandia* (1858), 8.—*Donkelaaria* Lem. *Ill. Hort.* ii. *Misc.* 72.—*Obbea* Hook. f. *Icon.* t. 1070; *Gen.* ii. 102.—*Burneya* (part) Ch. et Schlchtl, *Linnæa*, iv. 190.—*Rhytidotus* Hook. f. *Icon.* t. 1071 (*Rytidotus*).—H. Bn. *Adansonia*, xii. 242.

shaped or hypocrateriform; tube more or less elongate or very long, straight or curved; throat glabrous or pilose; limb various; lobes 3–10, imbricate and marginally more or less attenuate or crispate, valvate or subvalvate (*Timonius*,[1] *Chomelia*,[2] *Malanea*[3]). Stamens same in number as petals;[4] filaments rather long, short or 0; anthers dorsifixed introrse, oftener elongate. Germen 2–∞-celled;[5] lobes of style 2–∞, more or less free, pointed or thickened.[6] Ovules in cells solitary descending elongate cylindrical; raphe dorsal.[7] Fruit drupaceous; putamens 2–∞, or 1, ∞-celled; cells irregular or sometimes radiately 2–∞-seriate. Seed descending cylindrical; albumen membranous or 0; embryo axile fleshy conformed to seed oftener cylindrical; radicle terete superior.—Small trees or shrubs, glabrous or oftener pilose; leaves opposite or rarely verticillate, sessile or petiolate; stipules various, generally intrapetiolar, deciduous or caducous; flowers[8] rarely solitary or few, oftener crowded cymose; cymes sometimes spuriously capitate, often 1-parous, secund, bracteate or ebracteate, sometimes (*Hodgkinsonia*) spuriously umbellate by superposition. (*All trop. regions.*[9])

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[1] Rumph. *Herb. Amboin.* iii. 216 (1741).—DC. *Prodr.* iv. 461.—Endl. *Gen.* n. 3197 (part).—B. H. *Gen.* ii. 102, n. 203.—*Erithalis* Forst. *Prodr.* n. 17 (not L.).—*Nelitris* Gærtn. *Fruct.* i. 134, t. 27 (1788).—DC. *Prodr.* iii. 231.—Endl. *Gen.* n. 3192.—Baker, *Fl. Maurit.* 144.—Hook. *Fl. Ind.* iii. 126.—B. H. *Gen.* i. 716. n. 52 (dele in vol. vi. 353 note).—*Porocarpus* Gærtn. *Fruct.* ii. 473, t. 178.—*Helospora* Jack, *Tr. Linn. Soc.* xiv. 127, t. 4, fig. 3.—*Polyphragmon* Desf. *Mém. Mus.* vi. 5, t. 2.—*Pyrostria* Roxb. *Fl. Ind.* i. 388 (not Commers.).—*Burneya* Ch. et Schlchtl. *loc. cit.* (part).—*Eupyrena* Wight and Arn. *Prodr.* 422.—Endl. *Gen.* n. 3198.

[2] Jacq. *St. Amer.* 18, t. 13 (not L.).—Rich. *Rub.* 102.—DC. *Prodr.* iv. 484.—Endl. *Gen.* n. 3163.—B. H. *Gen.* ii. 103, n. 205.—*Anisomeris* Presl, *Symb.* ii. 5, t. 54.

[3] Aubl. *Guian.* i. 106, t. 41.—J. *Mém. Mus.* vi. 376.—Lamk. *Ill.* t. 66, fig. 2.—Rich. *Rub.* 122 (part).—DC. *Prodr.* iv. 459.—Endl. *Gen.* n. 3193.—B. H. *Gen.* ii. 103, n. 206.—*Cunninghamia* Schreb. *Gen.* 789 (not R. Br.).

[4] In females often fewer, or sterile, without or with effete anthers.

[5] Cells often fewer in male flower than in female or effete.

[6] Often in male flower elongate-subulate, glabrous or slightly tomentose, sometimes very long flexuose, as in *Hodgkinsonia* (F. Muell. *Fragm.* ii. 132;—Benth. *Fl. Austral.* iii. 420;—B. H. *Gen.* 106, n. 214) which appears to us only a sect. of *Guettarda*. Lobes of suburceolate corolla valvate or slightly imbricate. Germen cells 4, 1-ovulate. Ovule, as in the true *Guettardæ*, inserted under top of cell, cylindrical, conoid below; raphe dorsal; micropyle introrsely superior; hilum on both sides thickened to a rudimentary aril.

[7] Hilum often thickened and in seed arillose.

[8] White, small or moderate.

[9] Spec. about 140. Rheede, *Hort. Malab.* iv. t. 47, 48.—Jacq. *St. Amer.* 64, t. 177 (*Laugieria*). R. et Pav. *Fl. Per. et Chil.* ii. 22, t. 145 (*Laugeria*).—Vahl, *Symb.* iii. 40, t. 57 (*Laugeria*).—Benth. *Fl. Austral.* iii. 419; *Fl. Hongk.* 158 (*Guettardella*).—Seem. *Fl. Vit.* 130 (*Timonius*), 131.—Griseb. *Fl. Brit. W.-Ind.* 331, 333 (*Stenostomum*), 334 (*Chomelia*), 337 (*Malanea*); *Cat. Pl. Cub.* 131, 132 (*Stenostomum*).—A. Gray, *Proc. Amer. Acad.* iv. 35 (*Timonius*).—M. Arg. *Flora* (1875), 449, 450 (*Chomelia*), 453 (*Malanea*).—Bak. *Fl. Maur.* 143, 144 (*Antirrhœa, Timonius*).—Balf. f. *Bot. Rodrig.* 46 (*Antirrhœa*).—Miq. *Fl. Ind.-Bat.* ii 234 (*Polyphragmon*), 260; 355 (*Bobea*), 261, 303 (*Antirrhœa*); Suppl. 221, 545 (*Bobea*).—F. Muell. *Fragm.* ix. 183.—Bedd. *Ic. Pl. Ind. Or.* i. 190 (*Timonius*); *Fl. Sylv. S.-Ind.* t. 16, iv. (*Timonius*) 17, ii. cxxxiv. 3, 4 (*Timonius*).—Thw. *Enum. Pl. Zeyl.* 153.—Hiern, *Fl.*

65. **Canthium** Lamk.[1]—Flowers hermaphrodite or more rarely 1-sexual; receptacle obovoid, obconical or hemispherical. Calyx superior gamophyllous, entire, dentate or lobed, often deciduous. Corolla tubular, funnel-shaped or hypocrateriform, subcampanulate or urceolar; tube sometimes elongate (*Cyclophyllum*[2]), rarely more or less curved (*Ancylanthus*[3]); lobes of limb 4, 5, more rarely 3, 6, or more, valvate, sometimes thick pointed hard (*Cuviera*[4]); throat glabrous or oftener more or less densely pilose; hairs generally collected in a dense ring at various parts of the tube, deflexed. Stamens equal in number to lobes of corolla, inserted in throat or mouth, more rarely in tube of corolla; filaments generally short; anthers introrse, 2-rimose, apiculate; connective thick (often dark); cells generally free below. Germen 2-celled, or more rarely 3–∞-celled (*Pyrostria*,[5] *Fadogia*,[6] *Vangueria*,[7] *Cuviera*, *Peponidium*,[8] *Clusiophyllea*[9]); cells 1-ovulate. Ovule generally descending; raphe dorsal; micropyle introrsely superior; hilum more or less thickened on both sides;[10] or rarely subascending or ascending; micropyle extrorsely inferior (*Psydracium*[11]). Disk various, often thick; style erect, simple, sometimes bent, at stigmatose apex generally mitre-shaped, above conical

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Trop. Afr. iii. 125.—Chapm. *Fl. S. Unit. St.* 178.—H. Bn. *Adansonia*, xii. 238.—Walp. *Rep.* ii. 486, 487 (*Stenostomum*, *Sacconia*, *Eupyrena*), 942 (*Chomelia*); vi. 49; *Ann.* ii. 755 (*Chomelia*), 764, 765 (*Timoniu*); v. 113 (*Guettardella*). Of this genus also, in our opinion (see *Bull. Soc. Linn. Par.* 200), is *Abbottia singularis* F. Muell. (*Fragm. Phyt. Austral.* ix. 181) very near *Timonius* whose stamens are not monadelphous and the putamens are very similarly described as seeds.

[1] *Dict.* i. 602 (1783); *Ill.* t. 146.—J. *Gen.* 204; *Mém. Mus.* vi. 380.—Gærtn. f. *Fruct.* iii. 93, t. 196.—Rich. *Rub.* 107 (part).—DC. *Prodr.* iv. 473.—Endl. *Gen.* n. 3175.—H. Bn. *Adansonia*, xii. 179.—Hook. *Fl. Ind.* iii. 131.—*Psydrax* Gærtn. *Fruct.* i. 125, t. 26.—Rich. *Rub.* 110.—DC. *Prodr.* iv. 476.—*Dondisia* DC. *Prodr.* iv. 469.—Endl. *Gen.* n. 3216.—*Phallaria* Schum. et Thön. *Beskr.* 112.—*Mitrastigma* Harv. *Hook. Lond. Journ.* i. 20.—*Plectronia* DC. *Prodr.* iv. 475.—B. H. *Gen.* ii. 110, n. 227 (not L. nor Lour.).

[2] Hook. f. *Icon.* t. 1158; *Gen.* ii. 1229, n. 237 *a*.—H. Bn. *Adansonia*, xii. 183.

[3] Desf. *Mém. Mus.* iv. 5, t. 2.—Rich. *Rub.* 129.—DC. *Prodr.* iv. 468.—B. H. *Gen.* ii. 112, n. 232.

[4] DC. *Ann. Mus.* ix. 222, t. 15; *Prodr.* iv. 468.—Rich. *Rub.* 130.—*J. Mém. Mus.* vi. 396.—Endl. *Gen.* n. 3215.—B. H. *Gen.* ii. 112, n. 131.—H. Bn. *Adansonia*, xii. 193.

[5] Commers. *J. Gen.* 206; *Mém. Mus.* vi. 397.—Lamk. *Ill.* t. 68.—Rich. *Rub.* 136.—DC. *Prodr.* iv. 464.—Endl. *Gen.* n. 3204.—B. H. *Gen.* ii. 111, n. 130.—H. Bn. *Adansonia*, xii. 189, 195.—Baker, *Fl. Maurit.* 148.

[6] Schweinf. *Rel. Kotschs.* 47, t. 32.—B. H. *Gen.* ii. 111, n. 229.—H. Bn. *Adansonia*, xii. 192.—*Lagynias* E. Mey. ex Sond. *Fl. Cap.* 14, n. 4.—H. Bn. *loc. cit.* 191.—*Pachystigma* Hochst. *Flora* (1842), 234 (part).

[7] Commers. *J. Gen.* 206.—J. *Mém. Mus.* vi. 396.—Lamk. *Ill.* t. 159.—Poir. *Dict.* viii. 331.—Gærtn. f. *Fruct.* iii. 75, t. 193.—Rich. *Rub.* 137.—DC. *Prodr.* iv. 454.—Endl. *Gen.* n. 3191.—B. H. *Gen.* ii. 111, n. 228.—H. Bn. *Adansonia*, xii. 189, 191.—Hook. *Fl. Ind.* iii. 136.—*Vanguiera* Pers. *Synops.* i. 205.—*Vavanga* Rohr, *Act. Soc. Hafn.* ii. 208, t. 7.—*Meynia* Link. *Jarb.* iii. 32.—*Rytigynia* Bl. *Mus. Lugd.-Bat.* i. 178.

[8] H. Bn. *Adansonia*, xii. 196.

[9] H. Bn. *loc. cit.* 197.

[10] The origin of a slender aril.

[11] H. Bn. *Adansonia*, 199. Type of sect. is *Psydrax major* A. Rich. (*Rub.* 111).

entire or thinly lobed. Fruit 2–∞ -celled, drupaceous; putamens 1-∞ ; often 2-dymo-obcordate; flesh often scanty; epicarp glabrous, sericeous or hirsute. Albumen of generally descending rarely more or less ascending seed copious, fleshy or dense, rarely ruminate; cotyledons of straight or bent generally elongate embryo short; radicle superior. —Small trees or shrubs, rarely herbs (*Fadogia*), often glabrous or variously clothed; stem sometimes climbing, unarmed or often spinose; leaves opposite or verticillate; stipules inter- or intrapetiolar, cuspidate or acuminate, connate, persistent; flowers[1] in cymes or glomerules, oftener axillary, pedicellate or subsessile, rarely few or solitary; inflorescence involucrate with 2 bracts more or less connate (*Psydraæ*) or united in a broadly obconical cupule (*Scyphochlamys*[2]). (*All trop. reg. of Old World.*[3])

66 ? **Craterispermum** Benth.[4]—Flowers (nearly of *Canthium*) 5-merous; calyx cupular, dentate or sinuate, expanded coriaceous. Lobes of funnel-shaped or hypocrateriform corolla 5, valvate; throat pilose. Stamens 5, inserted in throat; filaments short; anthers oblong introrse dorsifixed, enclosed or exserted. Germen 2-celled; descending ovule &c. of *Canthium*;[5] disk epigynous thick; style branches 2, recurved or connate in a subfusiform mass. Fruit drupaceous; endocarp chartaceous; front of descending albuminous seed exsculptured; radicle of small embryo superior. Glabrous shrubs;[6] leaves opposite oblong coriaceous venose; stipules interpetiolar connate with petioles broad, persistent; flowers in axillary or supra-axillary pedunculate often capituliform cymes, bracteolate. (*Trop. Africa.*[7])

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[1] Generally small, more rarely rather large showy, white, greenish, yellowish or pink, sometimes sweet-scented.

[2] Balf. f. *Bak. Fl. Maur.* 149; *Journ. Linn. Soc.* xvi. 13; *Bot. Rodrig.* 48, t. 25.

[3] Spec. about 140. Jacq. *Hort. Schœnbr.* t. 44 (*Vangueria*).—Wight, *Icon.* t. 826, 1034, 1064 *bis* (*Plectronia*).—Roxb. *Pl. Corom.* t. 51 (*Plectronia*).—Harv. and Sond. *Fl. Cap.* iii. 13 (*Vangueria*), 16, 17 (*Plectronia*).— Balf. f. *Journ. Linn. Soc.* xvi. 14 (*Pyrostria*); *Bot. Rodr.* 47, t. 24 (*Pyrostria ?*).—Bak. *Fl. Maur.* 145 (*Plectronia*), 147 (*Vangueria*), 184 (*Pyrostria*).—Kl. *Pet. Moss. Bot.* 291.—Hiern, *Fl. Trop. Afr.* iii. 132, 146 (*Vangueria*), 152 (*Fadogia*), 156 (*Cuviera*), 158 (*Ancylanthos*).—Wawr. *Flora* (1875), 273.—Miq. *Fl. Ind.-Bat.* ii. 248 (*Vangueria*), 252, 313 (*Pyrostria*); Suppl. 544 (*Vangueria*), 221, 545.—Benth. *Fl. Austral.* iii. 420; *Fl. Hongk.* 158.—F. Muell. *Fragm.* ix. 185 (*Plectronia*). —Bedd. *Ic. Pl. Ind. Or.* t. 238, 239; *Fl. Sylv.* t. 221; cxxxiv. 5 (*Plectronia*).—Thw. *Enum. Pl. Zeyl.* 152.—H. Bn. *Adansonia*, xii. 220, 226. —Walp. *Rep.* ii. 475 (*Mitrastigma*), 484, 942 (*Vangueria*); vi. 46 (*Mitrastigma*), 47; *Ann.* i. 374; ii. 756, 764 (*Vangueria*), 765 (*Pachystigma, Cuviera, Dondisia*), 766 (*Rytigynia*); v. 112.

[4] *Niger Fl.* 411.—B. H. *Gen.* ii. 112, n. 233.—Baker, *Fl. Maurit.* 145.

[5] Of which perhaps rather a section ?

[6] Yellowish green.

[7] Spec. 4, 5. Poir. *Dict.* Suppl. ii. 14 (*Coffea*). —Hiern, *Fl. Trop. Afr.* iii. 160.—Baker, *Fl. Maur.* 145.— Benth. *Hook. Icon.* t. 1235.— Walp. *Ann.* ii. 758.

67 ? **Prismatomeris** Tw.[1]—Flowers polygamo-dicœcious; receptacle oblong-obovoid (shorter in male flower). Calyx cupular, subentire or 4, 5-dentate. Tube of hypocrateriform corolla terete, throat glabrous; lobes of limb 4, 5, elongate thickly 3-gonal, valvate or subreduplicate, finally patent. Stamens same in number enclosed (in female flower effete or 0); filaments short; anthers dorsifixed near base elongate introrse, 2-rimose. Germen (in male flower effete) 2-celled; disk various thick obconical or depressed rather concave; style slender, fusiform-2-lobed stigmatose above enclosed. Ovules in cells solitary descending, incompletely anatropous; micropyle introrse ventral, sometimes inferior. Fruit baccate globose or ovoid; cells 1, 2, 1-spermous. Seed subglobose, oftener unequal, ventrally attached; albumen copious dense; cotyledons of vertical or more or less oblique embryo ovate or reniform; radicle elongate inferior.—Shrubs oftener glabrous; branches sub-4-gonal (pale); leaves opposite, oblong-lanceolate coriaceous, shortly petiolate; stipules intrapetiolar rather broad and large cuspidate; flowers[2] in axillary or subterminal umbelliform cymes.[3] (*South east. trop. Asia, Ind. Archip.*[4])

68. **Damnacanthus** Gærtn. f.[5]—Flowers hermaphrodite or more rarely polygamous, 4, 5-merous; lobes of calyx pointed, persistent. Throat of funnel-shaped corolla glabrous; lobes 4, 5, thick-3-gonal, valvate. Exserted stamens &c. of *Prismatomeris*. Germen 2–4-celled; disk epigynous rather thick; branches of slender style 2–4, recurved obtuse papillose. Ovules in cells solitary, descending, incompletely anatropous or suborthotropous. Fruit drupaceous;[6] putamens 1–4, chartaceous, 1-spermous. Seeds descending; albumen horny copious; radicle of more or less oblique embryo inferior.—Very ramose shrubs; ramules partly sterile spinescent; leaves opposite (small), scarcely petiolate, ovate-acuminate coriaceous rigid glabrous; stipules intrapetiolar, 2, 3-cuspidate; flowers[7] axillary or subterminal, solitary or

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[1] *Hook. Kew Journ.* viii. 268, t. 7; *Enum. Pl. Zeyl.* 154, 421.—B. H. *Gen.* ii. 111, n. 250.—H. Bn. *Adansonia*, xii. 200.—Hook. *Fl. Ind.* iii. 159.

[2] Moderate, white.

[3] A genus very near *Canthium* (of which perhaps a sect.) differing chiefly in apex of style and peculiar character of ovule and seed.

[4] Spec. 1, 2. Roxb. *Fl. Ind.* i. 538 (*Coffea*).—Bedd. *Ic. Fl. Ind. Or.* t. 39; *Fl. Sylv. S. Ind.* t. 29, iv.; cxxxiv.–9.

[5] *Fruct.* iii. 18, t. 182, fig. 7.—DC. *Prodr.* iv. 473.—Endl. *Gen.* n. 3178.—B. H. *Gen.* ii. 118, n. 249.—H. Bn. *Adansonia*, xii. 322.—Hook. *Fl. Ind.* iii. 158.—*Baumannia* DC. *Pl. Rar. Jard. Genèv.* vi. 1, t. 1, 25.—Endl. *Gen.* n. 3189.

[6] "Red."

[7] White, moderate, odorous.

2, 3-nis, shortly pedunculate, free bracteolate.[1] (*Mount. India, China, Japan.*[2])

69. **Mitchella** L.[3]—Flowers[4] of *Damnacanthus*, 4, 5-merous (or more rarely 3–6-merous), 2-nate at top of axillary or terminal peduncle and connate with germens (receptacles). Germen 4-celled; style branches same in number; ovules in cell solitary descending suborthotropous; micropyle introrsely subapical. Fruit externally fleshy,[5] consisting of two 4-pyrenous drupes; pyrenes hence 8, rather thick, 1-spermous; radicle of richly albuminous embryo inferior. Other characters of *Damnacanthus*.—Creeping herbs or undershrubs; leaves (small) opposite, ovate or suborbicular; petiole short; stipules small interpetiolar. (*N. America, Japan.*[6])

70. **Dichilanthe** Thw.[7]—Flowers 5-merous; receptacle oblong, often curved. Calyx gamophyllous; lobes 5, sometimes unequal, elongate-acuminate rigid, entire or denticulate; minute denticules sometimes interposed. Corolla irregular, 2-labiate, valvate; throat villose. Stamens 5, inserted in throat, enclosed; anthers oblong, obtuse at produced base, pointed at apex. Germen 2-celled; disk epigynous thick, sometimes crenate; style exserted, incrassate to apex; at top of apex stigmatose, 2-lobed. Ovules in cells 1, descending, cylindroidal. Fruit "crowned with unequal calyx coriaceous, gibbous at back; seeds elongate cylindroid albuminous;" embryo . . . ?—Rigid resinous trees; leaves opposite coriaceous acuminate reticulate-veined; stipules intrapetiolar connate; flowers in a spurious capitule, glomerate sessile free; "resinous fructiferous calyces rather prominent rigid." (*Ceylon, Borneo.*[8])

71. **Salzmannia** DC.[9]—Flowers oftener hermaphrodite, 4-merous;

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[1] To be reduced perhaps to a sect. of *Mitchella*, as *Loniceræ* with 2 connate flowers to congeneric species with free germens Authors have noted the affinity with *Anthospermum*.

[2] Spec. 2. Walp. *Ann.* i. 984.

[3] *Gen.* n. 134.—J. *Gen.* 205; *Mém. Mus.* vi. 373.—Lamk. *Ill.* t. 63.—Gærtn. f. *Fruct.* iii. t. 192.—Rich. *Rub.* 140.—DC. *Prodr.* iv. 452.—Endl. *Gen.* n. 3188.—B. H. *Gen.* ii. 137, n. 296.—H. Bn. *Adansonia*, xii. 321.—*Chamædaphne* Mitch. *Gen.* 17 (not Buxb.).

[4] White, odorous, small.

[5] "Coccineous."

[6] Spec. 2. Lodd. *Bot. Cab.* t. 979.—A. Gray, *Man.* (ed. 2) 172.—Chapm. *Fl. S. Unit. St.* 176.—Walp. *Ann.* i. 985.

[7] *Hook. Kew Journ.* viii. 279, 376, t. 8 A (*Caprifoliaceæ*); *Enum. Pl. Zeyl.* 136.—B. H. *Gen.* ii. 103, n. 204.—Bedd. *Fl. Sylv.* t. 15, iv.; cxxxiv. 5.—Hook. *Fl. Ind.* iii. 128.

[8] Spec. 2: one *D. arborea* Thw.: the other hitherto apparently undescribed, viz. *D. borneensis* (Becc. exs. n. 3431).

[9] *Prodr.* iv. 617.—Endl. *Gen.* n. 3143.—B. H. *Gen.* ii. 106, n. 213.

calyx short, 4-dentate, persistent. Corolla funnel-shaped-tubular; lobes 4, valvate or subimbricate; throat glabrous. Stamens 4; filaments inserted at bottom of tube, connate at the base with each other and with the style in a short tube, free above; anthers basifixed elongate enclosed subsagittate, rimose or slightly extrorse at margin. Germen 2-celled; disk epigynous short; branches of slender style 2, linear stigmatose. Ovules in cells solitary; raphe dorsal, continuous with rather long sometimes dilated funicle; micropyle introrsely superior. Fruit drupaceous, by abortion 1-pyrenous, 1-spermous; embryo of descending seed . . . ?—A glabrous ramose shrub; branches resinous at apex; leaves (small) oblong or ovate glossy coriaceous; stipules interpetiolar short; flowers[1] in dense axillary cymes; pedicels very short, bracteolate.[2] (*Brazil.*[3])

72 ? **Phialanthus** Griseb.[4]—Flowers nearly of *Salzmannia*,[5] 4, 5-merous; calyx lobes subspathulate foliaceous obtuse venose, subequal or unequal, imbricate, persistent, somewhat accrescent. Corolla funnel-shaped-subcampanulate; lobes 4, 5, valvate or slightly imbricate at apex. Stamens inserted at base of corolla; filaments compressed; anthers dorsifixed at base ovate-oblong, exserted. Germen obconical, 2-celled; disk epigynous annular small; style slender, clavellate at stigmatose apex. Ovules &c. of *Salzmannia*. Fruit "drupaceous; seeds . . . ?"—A shrublet (resinifluous); leaves opposite (small) coriaceous elliptico-lanceolate; stipules intrapetiolar connate; flowers[6] axillary cymose or glomerulate; bracts sometimes connate in an involucel. (*Antilles.*[7])

73. **Cremaspora** Benth.[8] — Flowers 4, 5-merous; receptacle obconical or obovoid. Calyx tubular or campanulate, persistent; lobes pointed, closely contorted; throat glabrous or pilose. Stamens 4, 5; filaments short; anthers dorsifixed elongate, acute or acuminate or apiculate. Disk epigynous small or rather thick. Style slender exserted hirsute; branches 2, free or connate. Germen 2-celled; ovule in cells solitary descending; micropyle introrse superior or more

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[1] Minute, yellow?

[2] A genus, on the one hand, very near to *Cremaspora* by its inflorescence, on the other hand, by floral characters rather closely allied to *Scolosanthus*, *Erithalis*, if not to *Chiococca*.

[3] Spec. 1. *S. nitida* DC. *loc. cit.*

[4] *Fl. Brit. W.-Ind.* 335; *Cat. Pl. Cub.* 139.—B. H. *Gen.* ii. 106, n. 212.

[5] To which the genus is very near; *Chiococca* appears closely allied also to *Chione*.

[6] Minute, crowded.

[7] Spec. 3, 4.

[8] *Niger Fl.* 412.—B. H. *Gen.* ii. 108, n. 220.—H. Bn. *Bull. S. Linn. Par.* 206; *Adans.* xii. 321.

or less ventral or inferior; raphe dorsal. Fruit globose or ovoid, little fleshy, 1, 2-celled, 1, 2-spermous, more rarely 3, 4-spermous. Seeds descending; albumen horny, continuous (*Eucremaspora*) or oftener (*Polysphœria*[1]) deeply ruminate; radicle of vertical or oblique embryo superior or inferior. Other characters of *Coffea*.[2]—Ramose shrubs, glabrous or variously pubescent; leaves opposite, short-petiolate, ovate or oblong, membranous or coriaceous; stipules intra-petiolar, often cuspidate, deciduous; flowers in axillary cymes or glomerules. Bracts in 1 or more pairs superposed connate in a calycule.[3] (*Trop. south., east. and west. cont. and ins. Africa.*[4])

74. **Aulacocalyx** Hook. f.[5]—Flowers hermaphrodite; receptacle obconical. Calyx 4, 5-fid; lobes imbricate elongate-lanceolate or obtuse (*Belonophora*[6]). Corolla funnel-shaped or hypocrateriform, externally sericeous; tube slender; lobes 4, 5, closely contorted. Stamens 4, 5; anthers sessile dorsifixed introrse, enclosed (*Belonophora*) or semi-exserted. Germen 2-celled; disk epigynous more or less thick; style branches 2, erect or recurved papillose. Ovules solitary descending; micropyle introrse. Fruit subglobose coriaceous-fleshy; albumen of descending seed horny; cotyledons of small curved embryo subcordate; radicle superior.—Trees or shrubs; leaves opposite petiolate, elliptical or oblong acuminate; stipules inter-petiolar rigid acuminate, persistent or deciduous; flowers[7] axillary cymose or glomerulate, sometimes subsolitary, bracteolate.[8] (*Trop. west. Africa.*[9])

75 ? **Galiniera** Del.[10]—Flowers 5-merous or more rarely 4-merous (*Octotropis*[11]); receptacle obovoid or obconical. Calyx superior gamophyllous dentate, persistent. Corolla subrotate or shortly cam-

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[1] Hook. f. *Gen.* ii. 108, n. 221.

[2] To which the genus is very near, differing only by its descending ovule.

[3] Like *Tricalysia*, to which genus it also appears very near.

[4] Spec. about 10. Schum. et Thönn. *Beskr.* 108 (*Psychotria*).—DC. *Prodr.* iv. 499, n. 4 (*Coffea*).—G. Don, *Gen. Syst.* iii. 581 (*Coffea*).—Didr. *Kjob. Vid. Medd.* (1854) 187, n. 5.—Hiern, *Fl. Tr. Afr.* iii. 126, 127 (*Polysphœria*).—H. Bn. *Adansonia*, xii. 234, 283.—Walp. *Ann.* ii. 750.

[5] *Icon.* t. 1126.—B. H. *Gen.* ii. 109, n. 223.

[6] Hook. f. *Icon.* t. 1127.—B. H. *Gen.* n. 222.

[7] White, moderate.

[8] A genus closely allied to *Coffea*, differing chiefly by its descending ovule. Sect. in genus, in our sense, 2: 1. *Belonophora*; 2. *Euaulacocalyx*.

[9] Spec. 2. Hiern, *Fl. Trop. Afr.* iii. 129.

[10] *Ann. Sc. Nat.* ser. 2, xx. 92, t. 1; *Ferr. et Galin. Voy. Abyss.* iii. 138, t. 6.—B. H. *Gen.* ii. 91, n. 172.—*Ptychostigma* Hochst. *Schimp. Pl. Abyss. Exs.* n. 1586.

[11] Bedd. *Fl. Sylv.* 13, c. tab.; cxxxiv.—B. H. *Gen.* ii. 1229, n. 224 *a*.

panulate; throat pubescent or villosulous; lobes of limb 4, 5, closely contorted. Stamens 4, 5, inserted in mouth of corolla; filaments short; anthers introrse dorsifixed acuminate, 2-rimose, exserted. Germen 2-celled; disk annular or depressed; style short thick fusiform, produced to 8–10 narrow vertical wings; as many longitudinal furrows;[1] branches 2, solute or coalite. Ovules in cells solitary, descending; hilum more or less dilated fleshy; micropyle introrsely superior (sometimes a lateral mass added less than the ovule,[2] descending). Fruit small subspherical or short-ovoid, coriaceous-fleshy, 2-celled. Seeds in cells 1, "2," descending, arillate above; albumen ruminate;[3] radicle of oblique embryo lateral.—Small glabrous trees; leaves opposite petiolate, elliptical or lanceolate; stipules intrapetiolar, 3-angular acute, persistent; flowers in axillary or lateral compound cymes; branches short or sometimes elongate slender (*Rhabdostigma*[4]), bracteolate.[5] (*Trop. east. Asia, Travancore.*[6])

76. **Alberta** E. Mey.[7]—Flowers 5-merous; receptacle obconical or turbinate, 10-costate or smooth. Calyx 5-sepalous; folioles unequal; 1–4 accrescent, in fruit membranous venose.[8] Corolla elongate; tube straight or slightly curved; throat bare; lobes short acute contorted. Stamens 5, inserted in tube; anthers subsessile enclosed elongate dorsifixed, acuminate at apex, introrsely 2-rimose. Germen inferior, 2-celled; disk epigynous thick or depressed; style slender exserted, at apex fusiform long-pointed, straight or curved. Ovules in cells solitary, descending, attenuate below, above thickened to a flat aril (?). Fruit conformed to receptacle, 10-costate, crowned with sepals, coriaceous, indehiscent; seeds 1, 2, thinly albuminous; cotyledons of terete embryo small; radicle superior.—Trees or shrubs; leaves opposite; stipules intrapetiolar broad, deciduous; flowers in very compound-ramose cymiferous terminal racemes. (*South. Africa, Madagascar.*[9])

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[1] By impression of the anthers.

[2] A sterile ovule?

[3] Observed in one (African) species.

[4] Hook. f. *Gen.* ii. 109, n. 224.

[5] A genus apparently very near to *Hypobathrum*.

[6] Spec. 3, 4. Rich. *Fl. Abyss.* i. 355 (*Pouchetia*).—Hiern, *Fl. Trop. Afr.* ii. 114, 130 (*Rhabdostigma*).—Walp. *Rep.* vi. 43.

[7] *Linnæa*, xii. 258.—Endl. *Gen.* n. 3327; Suppl. i. 1394, n. 1313[1].—B. H. *Gen.* ii. 109, n. 225.

[8] Coloured.

[9] Spec. 2. Harv. and Sond. *Fl. Cap.* iii. 15.—Harv. *Thes. Cap.* t. 45.—H. Bn. *Adansonia*, xii. 247. Sepals in a species from Madagascar generally subequal.

77. **Nematostylis** Hook. f.[1]—Flowers hermaphrodite, 5-merous (of *Pavetta*); calyx lobes dissimilar; 4 smaller, unequal, subulate; the fifth foliaceous. Corolla tubular, pilose within, contorted or rarely imbricate. Stamens 5, enclosed. Germen 2-celled; disk epigynous small; style far exserted slender, at apex stigmatose capitellate truncate or 2-dentate. Ovule in cells 1, descending; hilum incrassate; micropyle introrsely superior. Fruit . . . ?—A puberulous shrublet; leaves opposite elliptical coriaceous; petiole short; stipules . . . ?; flowers[2] in terminal corymbiform cymes and with foliaceous bracts.[3] (*Madagascar.*[4])

78. **Lamprothamnus** Hiern.[5]—Flowers (nearly of *Cremaspora* or *Coffea*) 4–7-merous; calyx imbricate. Corolla funnel-shaped; throat pubescent; lobes of limb 4–7, closely contorted. Stamens same in number; anthers elongate-fusiform, dorsifixed to very short filament, versatile, 2-rimose. Germen 2-celled; disk epigynous glabrous; style elongate-fusiform exserted, at apex 2-fid or 2-dentate. Ovule in cells 1, descending short; hilum much dilated arilliform; raphe dorsal. Fruit . . . ?—A shrub; leaves opposite oval subsessile glossy; stipules interpetiolar apiculate; flowers[6] in terminal corymbiform shortly pedicellate cymes.[7] (*Zanzibar.*[8])

79. **Knoxia** L.[9]—Flowers hermaphrodite or polygamous, 2-morphous, 4, 5-merous; teeth or lobes of superior calyx 4, 5, more or less unequal; anterior 1, 2, sometimes larger foliaceo-lanceolate (*Pentanisia*[10]). Corolla funnel-shaped-campanulate or hypocrateriform; lobes 4, 5, valvate; throat variously pilose. Stamens 4, 5, inserted in throat, enclosed or exserted; anthers introrse, often subsessile. Germen 2-celled; disk epigynous orbicular; style slender far exserted, at apex stigmatose truncate or capitellate (*Pentanisia*) or oftener 2-lobed. Ovules in cells solitary, descending; raphe dorsal, sometimes

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[1] *Gen.* ii. 110, n. 226.—H. Bn. *Bull. Soc. Linn. Par.* 198.

[2] Rather large, pendent.

[3] A genus in the structure of the gynæcium quite analogous to *Machaonia*.

[4] Spec. 1. *N. anthophylla* H. Bn.—*N. loranthoides* Hook. f.—*Pavetta anthophylla* Rich. *Rub.* 101.

[5] *Fl. Trop. Afr.* iii. 130; *Hook. Icon.* t. 1220.

[6] White, rather large, odorous.

[7] A genus closely resembling *Coffea*; but ovule descending.

[8] Spec. 1. *L. zanguebaricus* Hiern, *loc. cit.*

[9] L. *Gen.* n. 123.—Gærtn. *Fruct.* i. 121, t. 215.—Rich. *Rub.* 72, t. 5, fig. 1.—DC. *Prodr.* iv. 569.—Endl. *Gen.* n. 3134.—B. H. *Gen.* ii. 104, n. 207.—Hook. *Fl. Ind.* iii. 128.—*Cuncea* Ham. ex Don, *Prodr. Fl. Nepal.* 135.

[10] Harv. *Hook. Lond. Journ.* i. 21.—B. H. *Gen.* ii. 104, n. 208.—*Diotocarpus* Hochst. *Flora* (1843), 70.

compressed. Fruit subglobose or oblong; cocci 2 solute from slender axis or 0 (*Pentanisia*). Seed descending, arillate above; albumen fleshy; cotyledons of axile embryo foliaceous; radicle terete superior. —Herbs, sometimes subshrubby, glabrous or variously clothed; leaves opposite, petiolate or sessile, ovate or lanceolate; stipules connate in a sheath oftener setose; flowers[1] in terminal cymes, sometimes more or less contracted and often finally spikelike (1-parous towards apex). (*Africa, trop. Asia and Oceania.*[2])

80 ? **Synisoon** H. Bn.[3]—Flowers hermaphrodite; receptacle ovoid. Calyx tubular subentire, hence finally longitudinally fissous. Corolla tubular-funnel-shaped; lobes of limb 5, closely contorted. Stamens 5; filaments inserted in hollows of corolla, subulate, at base dilated complanate; anthers exserted dorsifixed, introrsely rimose, versatile; connective apiculate; cells produced below in a foliaceous layer. Germen 5-celled; disk epigynous rather thick; style slender, apex exserted globose stigmatose, 5-lobulate above; lobes small acute, finally reflexed. Ovules in cells 2, collaterally pendulous from short funicle thickened at apex; micropyle introrsely superior. Fruit . . . ? —A tree (?); leaves opposite oblong petiolate; stipules interpetiolar short connate; flowers[4] in terminal corymbiform cymes.[5] (*British Guiana.*[6])

VIII. GENIPEÆ.

81. **Genipa** Plum.—Flowers hermaphrodite or 1-sexual, 4, 5-merous, or more rarely 6–10-merous; calyx epigynous various, entire, dentate, lobate, partite, or spathaceous, sometimes wide-foliaceous, persistent or deciduous. Corolla funnel-shaped or hypocrateriform or campanulate (*Amaralia*); tube sometimes short, or more rarely long narrow (*Griffithia*) or very long slender (*Leptactinia, Tocoyena, Roth-*

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[1] Pink or lilac, small.

[2] Spec. 8–10. Wall. *Pl. As. Rar.* t. 32.—Wight, *Ill.* ii. t. 128.—Harv. and Sond. *Fl. Cap.* iii. 24 (*Pentanisia*).—Hiern, *Fl. Trop. Afr.* iii. 131 (*Pentanisia*).—Kl. *Pet. Moss. Bot.* 286 (*Pentanisia*).—Miq. *Fl. In.-Bat.* ii. 329; Suppl. 225, 550.—Benth. *Fl. Austral.* iii. 438; *Fl. Hongk.* 164.—F. Muell. *Fragm.* ix. 187.—Thw. *Enum. Pl. Zeyl.* 151.—Walp. *Rep.* ii. 468; *Ann.* iii. 906.

[3] *Bull. Soc. Linn. Par.* 208.

[4] Rather large, white.

[5] A genus closely allied to none, somewhat resembling *Retiniphyllum*. But ovules descending; micropyle introrsely superior.

[6] Spec. 1. *S. Schomburgkianum* H. Bn.

mannia), sometimes constricted at mouth (*Byrsophyllum*) or perceptibly attenuate (*Sphinctanthus*); throat glabrous or variously pilose; lobes of limb 4–10, closely contorted. Stamens same in number, enclosed or exserted, inserted in throat or tube of corolla; cells introrse, rimose, continuous or more or less locellate (*Anomanthodia*, *Dictyandra*), obtuse or apiculate. Germen 2-celled; cells incomplete (*Gardenia*), or complete (*Randia*), more rarely 1, or more than 2 (*Morelia*), ∞-ovulate; disk epigynous various; style simple, at apex stigmatose variously dilated and 2-lobed, often fusiform or entire (*Mitriostigma*). Fruit (large or small) fleshy, coriaceous (*Heinsia*), indehiscent or breaking irregularly, sometimes with hard 2–5-valved endocarp. Seeds various, either ovoid, or oftener unequally-angled, sometimes short-winged (*Genipella*, *Paragenipa*); albumen fleshy or horny; cotyledons of axile embryo narrow or rather broad.—Trees or shrubs, sometimes climbing; leaves generally opposite petiolate entire coriaceous, oftener glabrous, veins sometimes crowded oblique lineolate (*Casasia*); stipules intrapetiolar or rarely interpetiolar, sometimes large, entire, obtuse or acuminate or cuspidate; flowers axillary or terminal, solitary or few cymose, rarely numerous, often large or rather large, more rarely small or (*Paragenipa*, *Randiella*) very small. (*All trop. regions.*)—See p. 305.

82. **Amaioua** Aubl.[1]—Flowers of *Genipa*, dicœcious or polygamous; calyx truncate, dentate or with calycinal lobes exterior to tube. Lobes of corolla 4–8, closely contorted, and as many stamens. Germen 2–8-celled; cells complete or incomplete. Fruit baccate, sometimes corticate, glabrous or hispid; seeds ∞, albuminous. Other characters of *Genipa*.—Trees or shrubs, glabrous, sericeous or hispid; leaves opposite or rarely 3-nate, sessile or petiolate; stipules interpetiolar; flowers[2] terminal solitary or in more or less contracted corymbiform or capituliform cymes.[3] (*Trop. America.*[4])

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[1] *Guian.* Suppl. 13, t. 375.—J. *Mém. Mus.* vi. 391.—Rich. *Rub.* 169.—DC. *Ann. Mus.* ix. 218; *Prodr.* iv. 369.—Endl. *Gen.* n. 3314.—B. H. *Gen.* ii. 81, n. 149.—H. Bn. *Bull. Soc. Linn. Par.* 200.—*Duroia* L. f. 30, 209.—B. H. *Gen.* ii. 82, n. 150.—*Hexactina* W. *Rel.* ex *Sch. Syst.* vii. 91.—*Alibertia* Rich. *Rub.* 154, t. 11, fig. 1.—Endl. *Gen.* n. 3229.—*Melanopsidium* Poit. (ex Rich.).—*Genipella* L.-C. Rich. (ex Endl.).—B. H. *Gen.* ii. 81, n. 148.—*Cordiera* Rich. *loc. cit.* 142, t. 10, fig. 2.—DC. *Prodr.* iv. 445.—Endl. *Gen.* n. 3220.—*Gardeniola* Cham. *Linnæa* ix. 247.—*Scepseothamnus* Cham. *loc. cit.* 248.—*Thieleodoxa* Cham. *loc. cit.* 251.—? *Ehrenbergia* Spreng. *Syst.* ii. 12 (ex Endl.).—? *Garapatica* Karst. *Fl. Colomb.* i. 57, t. 28 (ex B. H.).

[2] Rather large, white or straw-coloured, sometimes "sweet-scented."

[3] Rather a sect. of *Genipa*, flowers generally not hermaphrodite?

[4] Spec. about 40. H. B. K. *Nov. Gen. et Sp.* iii. t. 294.—Desf. *Mém. Mus.* vi. t. 4, 5.—Pœpp. et Endl. *Nov. Gen. et Sp.* iii. t. 230.—Benth. *Hook. Journ. Bot.* iii. 221.—Griseb. *Fl. Brit. W.-Ind.* 318, 319 (*Cordiera*); *Cat. Pl. Cub.* 123 (*Alibertia*).—C. de Mello, *Trans. Linn. Soc.*

83 ? **Rhyssocarpus** Endl.[1] — Male flower . . . ? Receptacle of solitary pedunculate female flower globose, longitudinally 10–12-costate; "ribs strong transversely rugose. Calyx 10–12-partite; lobes linear-spathulate erect open. Corolla hypocrateriform coriaceous; tube short; throat hirsute; lobes of limb 5, acute, puberulous, contorted. Staminodes 5, 6. Disk fleshy. Germen globose, 4-celled; branches of short style, linear erect. Ovules ∞, inserted on enlarged peltate placentas, amphitropous. Berry subglobose toruloso-costate . . . —A branched shrub or small tree; leaves opposite petiolate elliptico-oblong acuminate; stipules intrapetiolar connate in a "finally fissous" sheath, large deciduous.[2] (*Trop. America.*[3])

84. **Chapeliera** A. Rich.[4]—Flowers small (nearly of *Genipa*), 5-merous; receptacle obconical. Calyx lobes rigid acute, persistent. Corolla closely contorted, glabrous within. Stamens 5, inserted in throat; anthers dorsifixed, enclosed. Germen 2-celled; disk epigynous annular; style fusiform longitudinally sulcate. Ovules ∞, oftener few,[5] inserted along margins of long ovate placenta affixed to septum. Fruit ovoid (small) baccate coriaceous, crowned with calyx; seeds few, richly albuminous; testa thick curvo-sulcate and densely fibrous.[6] —A glabrous (evergreen) shrub; leaves opposite, shortly petiolate elliptico- or oblong-acute coriaceous penninerved; stipules interpetiolar cuspidate, generally persistent; flowers[7] in axillary or a little supra-axillary contracted cymes, bracteolate; bracteoles conformed to stipules.[8] (*Madagascar.*[9])

85. **Posoqueria** Aubl.[10]—Flowers nearly of *Genipa*, 5-merous; corolla tube very long slender; throat glabrous or variously pilose; limb before anthesis refracto-gibbous long-ovoid; lobes equal or

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xxviii. 519, t. 45 (*Alibertia*).—Walp. *Rep.* ii. 489 (*Cordiera*), 523 (*Scepseothamnus*), 524 (*Gardeniola, Thieleodoxa*); vi. 77.

[1] *Bot. Zeit.* (1843) 459; *Gen.* Suppl. 73.—B. H. *Gen.* ii. 29, 81, n. 148 *a*.—*Pleurocarpus* Kl. *Bonplandia* (1850), 3.

[2] A genus unknown to us; rather a sect. of *Amaioua*, germen and fruit being costate.

[3] Spec. 1. *R. pubescens* Endl.

[4] *Rub.* 172 (part).—DC. *Prodr.* iv. 389.—Endl. *Gen.* n. 3301.—B. H. *Gen.* ii. 96, n. 188.—H. Bn. *Bull. Soc. Linn. Par.* 200.—*Tamatavia* Hook. f. *Gen.* ii. 92, n. 173.

[5] Sometimes 5.

[6] Yellow or golden.

[7] "White."

[8] Rather a sect. of *Genipa*, very near *Paragenipa*, to be distinguished chiefly for the nature of its fibrous testa?

[9] Spec. 1. *C. madagascariensis* Rich.—*Tamatavia Melleri* Hook. f.

[10] *Guian.* i. 133, t. 51.—J. *Mém. Mus.* vi. 389. —Rich. *Rub.* 168 (not Wall.).—DC. *Prodr.* iv. 375.—Endl. *Gen.* n. 3308.—B. H. *Gen.* ii. 83, n. 153.—*Solena* W. *Spec.* i. 961.—*Cyrtanthus* Schr. *Gen.* 122.—*Kyrtanthus* Gmel. *Syst.* 362.—*Posoria* Rafin. *Ann. Gén. Sc. Phys.* vi. 80.—*Stannia* Karst. *Ausw. N. Gew.* 27, t. 9; *Fl. Col.* t. 16, 25.

unequal, contorted or imbricate. Stamens 5, inserted at mouth of corolla; filaments straight or curved, glabrous or hispid; anthers introrse, sometimes coalite with each other; cells sometimes unequal; connective produced below under cells to a simple or 2-lobed lamina. Germen 2-celled; cells complete or incomplete, ∞-ovulate; disk epigynous various, sometimes much produced; style slender, sometimes short, at apex stigmatose 2-fid. Fruit [1] baccate, often crowned with calyx; cells 1, 2, ∞-spermous. Seeds angular, exappendiculate, densely albuminous.—Glabrous trees or shrubs; leaves opposite petiolate coriaceous; stipules intrapetiolar rather large, deciduous; flowers [2] in terminal corymbiform cymes. (*Trop. America.*[3])

86. **Oxyanthus** DC.[4]—Flowers nearly of *Genipa;* calyx shortly tubular or urceolate, 5-dentate. Tube of hypocrateriform corolla long or oftener very long and slender; throat glabrous; lobes of limb 5, equal, closely contorted. Stamens 5, inserted at mouth or throat of corolla; filaments short; anthers exserted, dorsifixed at base; connective acuminate and generally produced in two lobes at base. Germen 2-celled; cells often incomplete; disk epigynous annular; style elongate very slender, clavate above and narrowly fusiform; lobes 2, stigmatose. Ovules in cells ∞, inserted on axile or oftener parietal 2-lobed placenta. Fruit baccate, 1-celled, crowned with calyx; seeds ∞, more or less angular or compressed; albumen fleshy; cotyledons of axile embryo foliaceous; radicle elongate. Other characters of *Genipa*.—Trees or shrubs; leaves opposite, sometimes unequal at base; petiole short; stipules intrapetiolar various, deciduous; flowers [5] axillary in corymbiform cymes; pedicels bracteolate.[6] (*Trop. and south. Africa.*[7])

87 ? **Kotchubea** Fisch.[8]—Flowers diœcious; receptacle of males

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[1] Generally rather large.

[2] White, yellowish, pink or coccineous, large showy, odorous.

[3] Rudg. *Guian.* t. 40, 41 (*Solena*).—Lindl. et Paxt. *Fl. Gard.* i. 185, fig. 114.—Pl. *Fl. Serr.* vi. 169, t. 587.—Lindl. *Bot. Reg.* (1841) t. 26.—Walp. *Rep.* ii. 520; vi. 76; *Ann.* ii. 797.

[4] *Ann. Mus.* ix. 518; *Prodr.* iv. 376.—J. *Mém. Mus.* vi. 390.—Endl. *Gen.* n. 3307.—B. H. *Gen.* ii. 91, n. 171.—*Candellaria* Smeathm. herb.—*Megacarpha* Hochst. *Flora* (1844), 551.

[5] White or yellow, odorous, sometimes very long.

[6] A genus hence very near to *Posoqueria*, thence to *Genipa* sect. of the *Tocoyena*, somewhat also allied to *Exostema*.

[7] Spec. about 15. Andr. *Bot. Rep.* t. 183 (*Gardenia*). — Schum. et Thönn. *Beskr.* 107 (*Ucriana*).—Lindl. *Collect.* t. 13.—Harv. and Sond. *Fl. Cap.* t. iii. 3.—Kl. *Pet. Mozs. Bot.* 292—*Fl. Serr.* ii. 148.—Hook. *Icon.* t. 785, 786.—Benth. *Nig. Fl.* 388.—Hiern. *Fl. Trop. Afr* iii. 106.—*Bot. Mag.* t. 1992, 4636.—Walp. *Rep* vi. 73 (*Megacarpha*).

[8] Ex DC. *Prodr.* iv. 373 (*Kutchulœa*).—Endl. *Gen.* n. 3312.—B. H. *Gen.* ii. 93, n. 193.

obconical solid. Calyx tubular coriaceous thick, subentire at truncate margin. Corolla long-funnel-shaped coriaceous; tube elongate, at throat dilated tomentose; lobes of limb (acute in bud) oftener 8, acute-acuminate, closely contorted, finally reflexed. Stamens 8, inserted in throat; filaments very short; anthers dorsifixed at base oblong, pointed at both ends, 2-fid at base; connective thick; cells linear introrse, longitudinally rimose. Disk epigynous short annular-depressed. Style erect; lobes 2, oblong papillose. Female flower . . . ? —"Drupe pea-shaped, crowned with calyx, 6, 7-pyrenous; pyrenes crustaceous, dorsally and laterally carinate, 1-spermous; seeds . . . ?" —A very tall glabrous tree; leaves opposite oblong membranous, narrowed to petiole; stipules intrapetiolar connate in a cupule; flowers [1] in scantily ramose corymbiform cymes.[2] (*Guiana.*[3])

88 ? **Phitopis** Hook. f.[4]—Flowers nearly of *Genipa;* calyx gamosepalous campanulate unequally lobed or dentate, sericeous or hirsute, valvate, persistent (?), Corolla subcampanulate; lobes 5 (more rarely 4, 6), obtuse, closely contorted, sericeous; throat pilose. Stamens same in number, inserted in throat; filaments short or subnil; anthers oblong introrse semiexserted, 2-rimose. Germen 2-celled; disk epigynous thick depressed; style branches 2, short obovate obtuse. Ovules in cells ∞, inserted on thick vertical obpyramidal 2-lobed placenta. Fruit . . . ?—Small hispid- or sericeo-villose trees; leaves opposite subsessile obovate-lanceolate acute; nerves subparallel divergent; stipules 2, free, deciduous; flowers [5] in compound racemiform 3-chotomous cymes; cymules 3-florous; bracts broad subinvolucrant spathaceous sericeous; bracteoles smaller conformed.[6] (*East. Peru.*[7])

89 ? **Billiottia** DC.[8]—Flowers nearly of *Genipa* (or *Amaioua*), dicœcious; calyx [9] of males campanulate; lobes 5 (or more rarely 4), acute recurved, equal or unequal; denticules as many alternate. Lobes

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[1] Large, showy.

[2] A genus imperfectly known; male flowers only examined by us; apparently very near to *Genipa.* A congener of *Rhyssocarpus ?*

[3] Spec. 1. *K. insignis* Fisch.—*Gardenia integra* Rich. *Rub.* 161.— *Patima ? laxiflora* Benth. *Hook. Journ. Bot.* iii. 220.

[4] *Icon.* t. 1093; *Gen.* ii. 84, n. 157.

[5] White, moderate.

[6] A genus apparently very near to *Genipa.*

[7] Spec. 1 (v. 2 ?). Spruce, exs. n. 4319, 4834 (*Hippotis*).

[8] *Prodr.* iv. 618 (not Coll. nor R. Br.).—B. H. *Gen.* ii. 80, n. 145.—*Melanopsidium* Cels (not Poit.).— Endl. *Gen.* n. 3328.—*Viviania* Coll. *Mém. Soc. Linn. Par.* iv. 25, t. 2 (not of others).

[9] Darkening on decaying.

of tubular-hypocrateriform corolla 5 (or 6, 7), obtuse, contorted, finally open; throat villose. Stamens as many alternate, inserted in tube; filaments short; anthers dorsifixed, apiculate; cells 2, free below; connective thickened at back. Disk situate in sterile germen cupular. Style fusiform, 2–5-dentate at apex. Female flower . . . ? Fruit fleshy, crowned with accrete calyx; cells 4, ∞ -spermous. Seeds (immature) compressed; embryo . . . ? — A small pubescent tree; leaves opposite glabrous or variously clothed oblong-lanceolate; stipules intrapetiolar connate in a sheath finally fissous; male flowers [1] in terminal corymbiform cymes; female solitary.[2] (*Brazil.*[3])

90 ? **Schachtia** KARST.[4]—Flowers diœcious (nearly of *Amaioua*). "Male calyx tubular, bearing 5 distant and erect hairs at truncate mouth, persistent. Lobes of hypocrateriform corolla 6–9, contorted, lanceolate, open. Stamens 6–9 (sterile in female flower), inserted in tube; anthers dorsifixed sessile subacute enclosed. Disk annular. Germen in female flower 2-celled, ∞ -ovulate; placentæ axile tumid; branches of short style 2, thick. Berry corticate hispid; cells 2, many-seeded. Seeds lenticular smooth, immerged in pulp; albumen copious; cotyledons of minute embryo foliaceous.—A hirsute tree; internodes tumid at apex; leaves opposite obovate-lanceolate; petiole short; stipules intrapetiolar connate in a sheath finally fissous and deciduous; flowers [5] terminal at top of short axillary twigs; males solitary; females cymose, shortly pedicellate." [6] (*Columbia.*[7])

91. **Stachyarrhena** HOOK. F.[8] — Flowers diœcious (nearly of *Amaioua*); male calyx cupular truncate or obtusely 5-lobed. Lobes of tubular subcampanulate coriaceous corolla 5, contorted; throat villose. Stamens 5, inserted in throat; anthers subsessile apiculate. Germen sterile; style short fusiform pilose. "Germen of female flower 4–∞ -celled; ovules ∞, inserted outside revolute lamellæ of placenta. Berry [9] shortly pedicellate, crowned with calyx; pedicels

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[1] Males moderate.

[2] Rather a sect. of *Amaioua ?*

[3] Spec. 1. *B. psychotrioides* DC.—*Viviania psychotrioides* COLL. — *Melanopsidium nigrum* CELS (ex DC.).

[4] *Linnæa* XXX. 156; *Fl. Colomb.* i. 89, t. 44.—B. H. *Gen.* ii. 80, n. 147.

[5] White, rather large.

[6] A genus almost unknown to us; whether a sect. of *Amaioua* or *Billiottia ?*

[7] Spec. 1. *S. dioica* KARST. *loc. cit.*

[8] *Icon.* t. 1868; *Gen.* ii. 80, n. 146.

[9] "Size of a cherry," according to figure, crowned with tubular calyx.

girt at base with cupular 2-plicate involucel; pericarp 4-celled,[1] ∞-spermous. Seeds rather large horizontal flat; testa thin subfibrous-cellulose."—Small glabrous trees; leaves[2] opposite oblong petiolate obtuse coriaceous; nerves divaricate; stipules intrapetiolar connate in cupule; flowers[3] in erect terminal glomeruliferous spikes.[4] (*Amazonian regions.*[5])

92. **Pouchetia** A. Rich.[6]—Flowers small (nearly of *Genipa*) hermaphrodite, 5-merous; calyx short, acute dentate. Corolla funnel-shaped, contorted; throat glabrous. Stamens 5, inserted in throat; anthers subsessile elongate enclosed or semiexserted acuminate; cells introrse, rimose, free at base. Germen 2-celled; cells incomplete above, ∞-ovulate; ovules 2-seriate on each placenta; disk epigynous annular; branches of slender style 2, rather thick, exserted or enclosed. Fruit baccate; seeds ∞, compressed, unequally 3-angular; testa externally fibrous, longitudinally filamentose-sulcate; embryo small, rich in albumen.—Glabrous shrubs; ramules virgate; leaves opposite oblong petiolate; stipules intrapetiolar connate, 3-angular; flowers[7] in cymiferous racemes, pedicellate; bracteoles minute.[8] (*Trop. west. Africa.*[9])

93. **Petunga** DC.[10]—Flowers small, hermaphrodite or rarely 1-sexual (nearly of *Genipa* or *Pouchetia*), 4, 5-merous; calyx dentate, persistent. Corolla funnel-shaped; lobes of limb oblong, contorted; throat villose. Stamens 4, 5, inserted in throat; anthers subsessile dorsifixed exserted; connective rather thick at apex; cells free below, rimose. Germen 2-celled; cells complete or incomplete. Ovules few, sometimes 2, or ∞, descending. Disk entire or 2-lobed; branches of slender style 2, densely pilose. Berry (small); seeds few imbricate; testa sulcate; albumen fleshy.—Virgate glabrous shrubs; leaves opposite petiolate; stipules intrapetiolar connate, 3-angular; flowers[11]

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[1] "? Always" (Hook. f.).

[2] "Under the lens granular, reddish-brown on drying."

[3] "White or yellow," small.

[4] A genus very near to *Amaioua*, differing chiefly in spikelike inflorescence.

[5] Spec. 2, 3. Spruce, exs. n. 661, 2696, 2891, 3142, 3322, 3346 (*Schradera*).

[6] *Rub.* 171.—DC. *Prodr.* iv. 393.—Endl. *Gen.* n. 3294.—B. H. *Gen.* ii. 92, n. 175.

[7] Small, "greenish-white."

[8] A genus allied on the one hand to *Chapeliera*, on the other to *Coffea*; from the latter it differs chiefly in cells being ∞-ovulate.

[9] Spec. 2. G. Don, *Gen. Syst.* iii. 159, n. 20 (*Wendlandia*).—Hiern. *Fl. Trop. Afr.* iii. 116.—Walp. *Ann.* ii. 793 (part).

[10] *Prodr.* iv. 398.—Endl. *Gen.* n. 3289.—B. H. *Gen.* ii. 93, n. 178.—Hook. *Fl. Ind.* iii. 120.—*Higginsia* Bl. *Bijdr.* 988 (not Pers.).—*Spicilaria* Rich. *Rub.* 172.

[11] White.

in axillary simple slightly ramose spikes, in axils of bracts solitary or cymose few, 2-bracteolate. (*India, Malaya, Ind. Archip.*[1])

94. **Fernelia** COMMERS.[2]—Flowers small (nearly of *Genipa* or *Pouchetia*), 1-sexual, oftener 4-merous; teeth of calyx elongate; corolla shortly hypocrateriform, contorted. Stamens inserted in throat of corolla or a little lower; anthers subsessile introrse acute (in female flower sterile, sometimes subspherical, or 0). Germen 1-celled; disk annular; branches of short style 2, linear-elongate stigmatose (in male flower minute or 0). Ovules ∞. Berry small coriaceous; seeds ∞, obtusely angular, densely albuminous. Other characters of *Pouchetia* or *Petunga*.—Very ramose glabrous shrubs; leaves opposite (small) coriaceous, orbicular, obovate or oblong; stipules interpetiolar small; flowers small axillary, solitary, 2-nate or few cymose; pedicels short or subnil; bracteoles connate in a dentate calycule under flower. (*Mascarene Is., Seychelles,*[3] *? Ind. Archip.*[4])

95. **Morindopsis** HOOK. F.[5]—Flowers small diœcious; receptacle of males short subhemispherical. Calyx short, 4-dentate, alternately imbricate.[6] Lobes of subcampanulate corolla 4, contorted; throat villose. Stamens 4, inserted in throat; anthers sessile dorsifixed enclosed acuminate, 2-rimose. Germen minute sterile; disk thick convex; branches of short style 2, pubescent. Receptacle of female flower oblong, sulcate and costate; teeth of persistent cupular calyx 4, acute. Corolla of males. Staminodes 4, inserted on corolla. Germen 2-celled; ovules ∞, peltate; thick style and disk of males. Fruit crowned with calyx, straight or curved, oblong-fusiform; pericarp thin subcoriaceous obtusely sulcate, indehiscent. Seeds ∞, compressed, imbricate; embryo . . . . ?—Glabrous or slightly pubescent shrubs; leaves opposite elliptical or lanceolate subcoriaceous; petiole short or 0; stipules interpetiolar short coriaceous cuspidate, persistent; flowers[7] axillary or somewhat supra-axillary pedunculate; males in contracted

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[1] Spec. 3, 4. ROXB. *Fl. Ind.* i. 144 (*Randia*).—MIQ. *Fl. Ind.-Bat.* ii. 200; Suppl. 217; *Ann. Mus. Lugd.-Bat.* iv. 130, 262.—WALP. *Ann.* ii. 792.

[2] *J. Gen.* 199; *Mém. Mus.* vi. 393.—LAMK. *Dict.* ii. 452; *Ill.* t. 67, fig. 1.—GÆRTN. F. *Fruct.* iii. 61, t. 191, 197.—RICH. *Rub.* 177.—DC. *Prodr.* iv. 398.—ENDL. *Gen.* n. 3290.—B. H. *Gen.* ii. 92, n. 176.—BAKER, *Fl. Maurit.* 142.—*Nivernenia* COMMERS. (ex LAMK.).

[3] Spec. 2, 3. BAKER, *Fl. Maurit.* 142.—BALF. F. *Bot. Rodrig.* 46, t. 23.

[4] MIQ. *Fl. Ind.-Bat.* ii. 218.

[5] *Gen.* ii. 93, n. 179.—HOOK. *Fl. Ind.* iii. 121.

[6] Lateral folioles exterior.

[7] White, small.

capituliform cymes at top of peduncle; females solitary decussately 4-bracteate [1] or cymose few. (*East. India, Cochin China, Malaya.*[2])

96. **Scyphostachys** Thw.[3]—Flowers small hermaphrodite (nearly of *Pouchetia* or *Petunga*), 4-merous; corolla narrow funnel-shaped; lobes of limb 4, contorted, recurved; throat villose. Stamens 4; filaments very short or 0; anthers enclosed; hairs of corolla throat collected in compressed masses alternating with stamens. Germen 2-celled; ovules few (often to 4). Berry ovoid-oblong; seeds few, descending, richly albuminous; testa sulcate; "cotyledons of eccentric embryo small."—Erect ramose shrubs; leaves opposite oblong-lanceolate acuminate coriaceous; stipules intrapetiolar acuminate, connate at base; flowers [4] in axillary or supra-axillary amentiform spikes, sessile and involucrate with younger connate imbricate early deciduous bracts.[5] (*Ceylon.*[6])

97. **Canephora** J.[7]—Flowers small hermaphrodite (nearly of *Genipa*); receptacle obovate; calycinal teeth 5, or more rarely 3–6, acute. Lobes of nearly funnel-shaped corolla 5 (or 4, 6) contorted; throat glabrous or slightly pubescent. Stamens same in number, inserted in throat; anthers subsessile, introrse. Germen 2-celled; lobes of rather thick style 2, approximate stigmatiferous. Ovules in cells ∞, often few, compressed. Fruit "baccate pealike coriaceous;" seeds . . . ?—A shrub; leaves opposite elliptical acuminate coriaceous glabrous; stipules connate with petioles, 3-angular; flowers [8] compound cymose at top of compressed alate leaf-like peduncle; pedicel very short; bracts and bracteoles stipuliform shortly imbricate in an involucre under flowers. (*Madagascar.*[9])

98. **Hypobathrum** Bl.[10]—Flowers small, hermaphrodite or very rarely 1-sexual; receptacle obconical or obovoid. Calyx short

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[1] Bracts opposite calyx lobes.

[2] Spec. 2, 3. Wall. *Cat.* n. 8433 (part), 8434 (*Morinda*).—Kurz, *For. Fl. Brit. Burm.* ii. 52.

[3] *Enum. Pl. Zeyl.* 157.—B. H. *Gen.* ii. 94, n. 181.—Hook. *Fl. Ind.* iii. 122.

[4] Small or very small.

[5] A genus with the habit of *Lasianthus*, differing chiefly in germen being pluriovulate.

[6] Spec. "2." Bedd. *Icon. Pl. Ind. Or.* t. 240; *Fl. Sylv.* t. 16, vi.; cxxxiv.

[7] *Gen.* 208.—Lamk. *Ill.* t. 151, fig. 1 (not 2).—Poir. *Suppl.* ii. 77.—J. *Gen.* 208; *Mém. Mus.* vi. 401.—Rich. *Rub.* 181.—DC. *Prodr.* iv. 617.—Endl. *Gen.* n. 3284.—B. H. *Gen.* ii. 74, n. 129.—H. Bn. *Bull. Soc. Linn. Par.* 199.

[8] Small, white?

[9] Spec. 1. *C. axillaris* Lamk.

[10] *Bijdr.* 1007 (1826).—Rich. *Rub.* 118.—DC. *Prodr.* iv. 451.—Endl. *Gen.* n. 3186.—B. H. *Gen.* ii. 93, n. 177.—H. Bn. *Adansonia*, xii. 201.—*Nesœdia* Rich. *Rub.* 112.—DC. *Prodr.* iv. 477.—Endl. *Gen.* n. 3172.—H. Bn. *loc. cit.* 204.—

gamophyllous, entire, dentate or lobed. Corolla funnel-shaped, hypocrateriform or subcampanulate; tube glabrous within or variously pilose; lobes of limb 4–6 (often 5), closely contorted; throat glabrous or villose, sometimes very densely barbate (*Empogona*, *Eriostoma*). Stamens as many, inserted in throat or mouth of corolla; filaments short or subnil, rarely rather long; anthers dorsifixed, 2-fid at base, generally elongate, versatile, exserted or semienclosed; connective sometimes produced in an oblong or subspathulate lamina beyond cells (*Kraussia*, *Empogona*). Germen inferior (adnate to receptacle), 2- or rarely 3-celled; cells sometimes incomplete; disk epigynous various, oftener depressed, sometimes minute; style slender, rather thick or rarely thick fusiform, longitudinally sulcate (*Nargedia*); branches very rarely 3, or generally 2, more or less connate, recurved, often linear, papillose or hispid, often glabrous in front (and there nigrescent); one sometimes smaller or aborted, the other 2-dentate at apex (*Zygoon*). Ovules in cells few, rarely 6–10 (*Diplospora*, *Hyptianthera*), or oftener 2–5, rarely 1 (*Kraussiella*,[1] *Nescidia*), incompletely anatropous,[2] vertical or oblique, sometimes 2-seriate; micropyle generally extrorse and inferior; placenta thickened around nestling ovules or more rarely not or slightly dilated (*Zygoon*, *Nescidia*, *Feretia*). Fruit baccate (small); seeds 1 or few; albumen copious fleshy; radicle of various embryo various, often inferior.—Erect or rarely climbing shrubs, glabrous or variously clothed; leaves opposite, oftener elliptical or oblong; petiole generally short; stipules interpetiolar or intrapetiolar (*Feretia*), oftener small acute, deciduous or persistent; flowers[3] axillary solitary or oftener ∞, cymose or glomerulate; bracteoles 2, or 4–8,

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Tricalysia Rich. *Rub.* 144.—DC. *Prodr.* iv. 445. —Endl. *Gen.* n. 3221.—B. H. *Gen.* ii. 95, n. 185. —H. Bn. *loc. cit.* 206.—*Bunburya* Meissn. *Flora* (1844), 553.—*Natalanthe* Sond. *Linnæa*, xxiii. 52.—*Rosea* Kl. *Monatsb. Akad. Wiss. Berl.* (1853) 501; *Pet. Moss. Bot.* 293, t. 45, 46.—*Kraussia* Harv. *Hook. Lond. Journ.* i. 21.—B. H. *Gen.* ii. 95, n. 184.—H. Bn. *loc. cit.* 206.—*Carpothalis* E. Mey. exs. *Drég.* (ex Harv. and Sond.).—*Feretia* Del. *Ann. Sc. Nat.* ser. 2, xx. 92, t. 1, fig. 4.—B. H. *Gen.* ii. 95, n. 183.—H. Bn. *loc. cit.* 211.—*Hyptianthera* Wight and Arn. *Prodr.* i. 399 (1834).—Endl. *Gen.* n. 3303.—B. H. *Gen.* ii. 94, 1228, n. 180.—Hook. *Fl. Ind.* iii. 121.—*Diplospora* DC. *Prodr.* iv. 477 (1830).—Endl. *Gen.* n. 3176.—B. H. *Gen.* ii. 96, n. 186.—H. Bn. *loc. cit.* 211.—Hook. *Fl. Ind.* iii. 122.—*Dicospermum* Dalz. *Hook. Kew Journ.* ii. 257.—*Empogona* Hook. f. *Icon.* t. 1091; *Gen.* ii. 94, n. 182.—H. Bn. *loc. cit.* 204.—*Diplocrater* Hook. f. *Gen.* ii. 96, n. 187.—*Zygoon* Hiern, *Fl. Tr. Afr.* iii. 113 (1877).—H. Bn. *loc. cit.* 204.—*Nargedia* Bedd. *Fl. Sylv.* t. 328, cxxxiv.—Hook. *Fl. Ind.* iii. 122.—*Pentaspora* Bvn. (ex H. Bn. *loc. cit.* 208).—*Eriostoma* Bvn. (ex H. Bn. *loc. cit.*).

[1] H. Bn. *Adansonia*, xii. 204.

[2] Raphe ventral and superior, generally very short, so that the ovule often appears spuriously descending. Ovules (?) sometimes (*Zygoon*) sterile 1, 2, inserted in side of fertile.

[3] Small or very small, sometimes precocious (*Zygoon*, *Feretia*), white or yellowish, sometimes, as said, very odorous. But all characters nearly as in the Coffees.

free, small or developed, oftener in 1–4 calycules, superposed, entire or dentate, connate in pairs under germen of flower.[1] (*Trop. Africa, Asia and Oceania.*[2])

99. **Burchellia** R. Br.[3]—Flowers hermaphrodite; receptacle turbinate. Calyx deeply 5-lobed, persistent; lobes subulate subequal. Corolla tubular; lobes 5, acute oblique, contorted; tube annular short pilose within; throat pilose. Stamens 5, inserted at middle of tube; filaments short subulate; anthers elongate subbasifixed, unguiculate at apex, introrsely 2-rimose. Germen 2-celled; disk epigynous rather thick; styles thickened at middle, minutely denticulate stigmatose at apex. Ovules ∞, inserted on thick subpeltate placenta. Fruit fleshy, crowned with somewhat accrete calyx; seeds ∞, compressed-angular; albumen densely fleshy; cotyledons of axile embryo complanate; radicle long terete.—A small tree or shrub; leaves opposite oblong obtuse coriaceous penninerved, shortly petiolate; stipules interpetiolar pointed; flowers[4] in contracted terminal capituliform cymes. (*South. Africa.*[5])

100 ? **Flagenium** H. Bn.[6]—Flowers hermaphrodite; receptacle oblong. Calyx deeply 5-lobed; lobes linear-subulate, persistent (?). Corolla[7] funnel-shaped (?); lobes 5, closely contorted. Stamens 5, inserted in corolla. Germen 2-celled; style . . . ? Ovules in cells few (∞), inserted on small axile ellipsoid placenta; the upper ascending; the lower descending,[8] anatropous. Fruit fleshy (?), "glabrous, oblong, crowned with calyx and rather longer than it."—

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[1] A genus in some respects allied to the small-flowered *Genipas, Chapeliera, Petunga*, &c. in others to *Galiniera*, by the intervention of *Nargedia;* the 1-ovulate species in particular scarcely distinguishable from *Coffea*.

[2] Spec. about 45. Harv. and Sond. *Fl. Cap.* iii. 22 (*Kraussia*), 23 (*Bunburya*).—Miq. *Fl. Ind.-Bat.* ii. 236, 237 (*Diplospora*); 304 (*Coffea*, part).—Benth. *Fl. Austral.* iii. 413 (*Diplospora*); *Fl. Hongk.* 157 (*Diplospora*).—Bedd. *Ic. Pl. Ind.* i. t. 40 (*Discospermum*); *Fl. Sylv.* t. cxxxiv. 3 (*Diplospora*).—Thw. *Enum. Pl. Zeyl.* 158 (*Discospermum*).—Kurz, *For. Fl. Brit. Burm.* ii. 50.—Hiern, *Fl. Trop. Afr.* iii. 114 (*Empogona*), 115 (*Feretia*), 117.—H. Bn. *Adansonia*, xii. 225.—Walp. *Rep.* ii. 518 (*Hyptianthera*), 525 (*Kraussia*); vi. 38 (*Bunburya*), 47 (*Kraussia*), 701 (*Hyptianthera*); *Ann.* i. 757 (*Kraussia, Diplospora*), 796 (*Discospermum*); v. 132 (*Rosea*).

[3] *Bot. Reg.* t. 466, 891.—Rich. *Rub.* 180.—DC. *Prodr.* iv. 368.—Endl. *Gen.* n. 3315.—B. H. *Gen.* ii. 85, n. 158.—*Bubalina* Rafin. *Ann. Gén. Phys.* vi. 86.—*Cancphora* Lamk. (part, not J.).

[4] Coccineous or golden.

[5] Spec. 1. *B. bubalina* Sims, *Bot. Mag.* t. 2339.—*B. capensis* R. Br.—Harv. and Sond. *Fl. Cap.* iii. 3.—*B. parviflora* Lindl. *Bot. Reg.* t. 891.—*B. Kraussii* Hochst. *Flora* (1842), 237.—*Lonicera bubalina* L.f. *Suppl.* 146.—Thunb. *Fl. Cap.* 181.—*Canephora capitata* Lamk. *Ill.* t. 151, fig. 2.—*Cephælis bubalina* Pers. *Syn.* i. 202, n. 12.

[6] *Bull. Soc. Linn. Par.* 216.

[7] Adult unknown.

[8] One often quickly surpassing the rest, ascending or descending; micropyle constantly contiguous to placenta.

A shrub with virgate velvety stem; leaves shortly petiolate, oblong-lanceolate acuminate, pale villose beneath; stipules lanceolate-subulate undivided, connate with petioles at dilated base; flowers in contracted axillary 2-parous cymes, often 3-nate, sometimes more numerous;[1] bracteoles conformed to stipules.[2] (*Madagascar.*[3])

101. **Scyphiphora** Gærtn. f.[4]—Flowers hermaphrodite or polygamous; receptacle tubular, obconical at base. Calyx short, inserted at top of tube, gamophyllous, unequally dentate or truncate, near anthesis generally dividing longitudinally, persistent. Corolla hypocrateriform; tube cylindrical; lobes of limb 4, 5, contorted, presently open-recurved. Stamens 4, 5, inserted in throat of scantily pilose corolla; filaments short; anthers dorsifixed at middle; cells 2, introrse, apiculate to produced connective, free below, pointed, longitudinally rimose (in female flower sometimes effete or 0). Germen inferior, 2-celled, crowned with epigynous orbicular or lobed disk; style erect, 2-ramose towards apex; branches linear-subulate papillose. Ovules in cells 2, 3, of which 1, 2, upper generally ascending, rarely obliquely descending; the lower 1 oftener descending; raphe dorsal; funicle short thickened above micropyle. Fruit drupaceous oblong, cylindrical-compressed; flesh scanty; pyrenes crustaceous, 5-costate. Seeds in each 1–3, slightly albuminous; either all fertile or part sterile; embryo of the upper ones oftener erect; radicle inferior; of the lower one superior; cotyledons plano-convex fleshy; endocarp transversely thickened between seeds in spurious dissepiments.—A glabrous shrub;[5] branches terete nodose, gummy towards apex; leaves short opposite, petiolate, entire, coriaceous; flowers[6] in dense axillary short-pedunculate cymes, articulate at base. (*Ceylon, Ind. Archip., Australia, N. Caledonia.*[7])

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[1] Specific name hence improper.

[2] A genus imperfectly known from imperfect flowers and immature fruit, corolla certainly not valvate (as in *Sabicea*).

[3] Spec. 1. *F. triflorum* H. Bn.— *Triosteum triflorum* Vahl, *Symb.* iii. 37.—Poir. *Dict.* viii. 109, n. 3.—*Sabicea? triflora* DC. *Prodr.* iv. 439, n. 5.

[4] *Fruct.* iii. 91, t. 196.—Rich. *Rub.* 79.—DC. *Prodr.* iv. 577.—Endl. *Gen.* n. 3112.—B. H. *Gen.* ii. 99, n. 194.—H. Bn. *Bull. Soc. Linn. Par.* 174.—Hook. *Fl. Ind.* iii. 125.—*Epithinia* Jack, *Malay. Misc.* i. *n*, v. 12.—*Hydrophylax* Banks (ex DC.), not L. f.

[5] Habit and leaves of some *Rhizophoraceæ*.

[6] Small, whitish?

[7] Spec. 1. *S. hydrophilacea* Gærtn. f.—Bl. *Bijdr.* 955.—Benth. *Fl. Austral.* iii. 417.—A. Gray, *Proc. Amer. Acad.* iv. 307.—Miq. *Fl. Ind.-Bat.* ii. 238; Suppl. 220, 543.—F. Muell. *Frag.* ix. 187.—*Epithinia malayana* Jack.—Griff. *Ic. Pl. As.* iv. 478.—Thw. *Enum. Pl. Zeyl.* 157.

102. **Bertiera** Aubl.[1]—Flowers hermaphrodite or polygamous; receptacle obconical or subspherical. Calyx cupular entire or 5-dentate or lobed. Corolla[2] funnel-shaped; tube often sericeous; lobes of limb 5, ovate-acute, closely contorted or more rarely imbricate (1 interior; 1 exterior). Stamens 5, inserted in throat or tube, sometimes near base of corolla; filaments short or subnil; anthers enclosed introrse, thinly apiculate or appendiculate; cells rimose, free at base. Germen 2-celled; disk annular or cupular; style fusiform subentire or divided into 2 thick or thin stigmatiferous branches. Ovules ∞, inserted on slightly prominent placenta sometimes thickly stipitate and affixed to septum. Fruit oblong or fusiform, fleshy or coriaceous. Seeds ∞, angular, externally granular or foveolate; albumen fleshy; cotyledons of straight or curved embryo ovate.—Small trees or shrubs, glabrous or variously clothed; leaves opposite petiolate oblong-acuminate; stipules intrapetiolar connate; sheath sometimes large unequally divided; flowers[3] in axillary, often pendent, pedunculate, compound cymiferous racemes, sometimes sessile; cymes sometimes 1-parous. (*Trop. America, trop. cont. and east. trop. ins. Africa.*[4])

103. **Hamelia** Jacq.[5]—Flowers generally hermaphrodite; receptacle ovoid or obconical, sometimes costate. Calyx gamophyllous; folioles at base or scarcely connate, sometimes rather large,[6] persistent. Corolla narrow-tubular or subcampanulate, sometimes dilated at base and sometimes narrowed a little above, longitudinally costate; limb 5, 6-lobed, often short, imbricate. Stamens 5, 6, alternate, inserted in tube of corolla, sometimes at base; filaments free or very shortly connate at base; anthers elongate narrow basifixed introrse, 2-rimose, enclosed or exserted; connective slightly produced beyond cells. Germen[7] 2–6-celled; cells 2–6,[8] ∞-ovulate; disk epigynous thick-

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[1] *Guian.* i. 180, t. 69.—Lamk. *Ill.* t. 165.—Gærtn. f. *Fruct.* iii. t. 192.—J. *Mém. Mus.* vi. 390.—Rich. *Rub.* 173, t. 13, fig. 1.—DC. *Prodr.* iv. 391 (part).—Endl. *Gen.* n. 3295.—B.H. *Gen.* ii. 77, n. 138.—Baker, *Fl. Maurit.* 141.—*Pomatium* Gærtn. f. *Fruct.* iii. 252, t. 225.—DC. *Prodr.* iv. 391.—Endl. *Gen.* n. 3296.—*Zaluzania* Comm. (ex Gærtn. f. *Fruct.* t. 192, f. 6).

[2] Acute in bud.

[3] Small, white or greenish.

[4] Spec. about 15. Griseb. *Fl. Brit. W.-Ind.* 321.—G. Don, *Gen. Syst.* iii. 519 (*Wendlandia*).—Bak. *Fl. Maur.* 141.—Hiern, *Fl. Trop. Afr.* iii. 82.—Walp. *Rep.* ii. 517; vi. 73; *Ann.* ii. 793.

[5] *St. Amer.* 71, t. 50; *Ic. Rar.* t. 335.—Gærtn. f. *Fruct.* iii. 63, t. 191, 196.—Rich. *Rub.* 147.—DC. *Prodr.* iv. 441.—Endl. *Gen.* n. 3228.—B.H. *Gen.* ii. 75, n. 134.—H. Bn. *Adansonia*, i. 374.—*Tangaraca* Adans. *Fam. Pl.* ii. 147 (1763).—*Duhamelia* Pers. *Synops.* i. 203. — ? *Tepesia* Gærtn. f. *Fruct.* iii. 72, t. 192.

[6] Sometimes coloured.

[7] Sometimes coloured externally.

[8] Lobes of corolla, when the same in number, opposite.

conical or tumid; style narrowly fusiform to apex, sometimes sulcate contorted; stigmatiferous lobes 2–6, often very short. Ovules ∞, inserted on slightly prominent axile placenta. Fruit fleshy, crowned with disk and calyx; seeds ∞, small angular reticulate; embryo subclavate, richly albuminous.—Glabrous or pubescent shrubs; leaves opposite or verticillate, petiolate, ovate-oblong membranous; stipules interpetiolar pointed, deciduous; flowers [1] in terminal more or less ramose and 1-parous cymes, sometimes sessile; bracts minute or 0. (*Warm N. and S. America.*[2])

104. **Bothriospora** Hook. f.[3]—Flowers hermaphrodite; receptacle obconical. Calyx lobes 4, 5, membranous obtuse, imbricate persistent. Tube of subrotate corolla short; throat villose; lobes of finally patulous limb 4, 5, somewhat unequal, imbricate (1 or 2 exterior). Stamens 4, 5, inserted in throat; filaments slender, pilose at base; anthers dorsifixed oblong, introrse, finally exserted, recurved, 2-rimose. Germen 4, 5-celled; disk epigynous annular; branches of erect style 4, 5, linear obtuse stigmatiferous. Ovules in cells ∞, inserted on subpeltate axile placenta. Fruit "baccate (small) subglobose succulent, 4, 5-celled polyspermous; seeds minute oblong; testa foveolate; albumen fleshy; embryo subcylindrical." — Small trees; "bark deciduous;" [4] last ramules puberulous; leaves opposite ovate-oblong petiolate; stipules intrapetiolar lanceolate, deciduous; flowers [5] in terminal 3-chotomous compound umbelliform cymes.[6] (*Guiana, north Brazil.*[7])

105. **Hoffmannia** Sw.[8]—Flowers generally 4-merous;[9] receptacle obovoid or obconical, sometimes costate. Calyx gamophyllous; lobes short or elongate recurved (*Xerococcus*); sometimes small laciniæ

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[1] Rather large or moderate, light or deep yellow or rubicund.

[2] Spec. about 10. Plum. *Gen.* 17, t. 33 (*Lonicera*).—R. et Pav. *Fl. Per.* ii. t. 221.—Sm. *Exot. Bot.* t. 24.—Lhér. *Sert.* t. 7.—Salisb. *Par.* t. 55.—Griseb. *Fl. Brit. W.-Ind.* 320.—Chapm. *Fl. S. Unit. St.* 178.—Clos, *C. Gay Fl. Chil.* iii. 204 (*Tepesia*).—*Bot. Reg.* t. 1195.—*Bot. Mag.* t. 1894, 2533.—Walp. *Rep.* vi. 51.

[3] *Icon.* t. 1069; *Gen.* ii. 76, n. 136.

[4] Wood "veined."

[5] White, small; fruit "yellow."

[6] A genus in some respects very near *Sabicea* and *Patima*, but corolla imbricate not valvate; in other respects near *Machaonia*, but ovule not solitary.

[7] Spec. 1. *B. corymbosa* Hook. f.—*Evosmia corymbosa* Benth. *Hook. Journ. Bot.* iii. 219.—Walp. *Rep.* ii. 489.

[8] *Prodr.* 30 (1788); *Fl. Ind. Occ.* i. 241, t. 5.—Rich. *Rub.* 179.—Endl. *Gen.* n. 3287.—B. H. *Gen.* ii. 76, n. 135.—*Ohigginsia* R. et Pav. *Fl. Per.* i. 55, t. 85.—*Higginsia* Pers. *Synops.* i. 133.—*Euosmia* H. B. *Pl. Æquin.* ii. 165, t. 134 (1809).—Rich. *Rub.* 152.—DC. *Prodr.* iv. 438.—Endl. *Gen.* n. 3222.—B. H. *Gen.* ii. 71, n. 118.—H. Bn. *Bull. Soc. Linn. Par.* 199.—*Campylobotrys* Lem. *Fl. Serres*, iii. *Misc.* n. 37; v. t. 427; *Jard. Fleur.* i. t. 42.—*Xerococcus* Œrst. *Vidensk. Meddel. Kjob.* (1852) 52.—B. H. *Gen.* ii. 70, n. 116.—*Ophryococcus* Œrst. *loc. cit.* 70.

[9] Rarely 5-merous.

intervening, solitary or 2-nate (stipules ?), sometimes glandular. Corolla funnel-shaped or subcampanulate; tube short; throat glabrous; lobes of limb generally attenuate at margin (*Euosmia*), imbricate, sometimes costate at back. Stamens as many alternate, inserted in mouth or throat of corolla, sometimes near base of tube; filaments short, often complanate; anthers dorsifixed oblong introrse, 2-rimose. Germen 2, 3-celled[1]; disk epigynous annular or pulvinate; style slender more or less dilated above; lobes stigmatose short or more or less connate, sometimes scarcely distinct. Ovules in cells ∞, inserted on rather prominent sometimes 2-lobed placentas. Fruit obovoid or oblong, fleshy or sometimes dry coriaceous (*Xerococcus*), costate or sulcate, 2–4-celled; seeds crowded, sometimes angular, reticulate or foveolate; albumen fleshy; embryo small straight, sometimes clavate.—Shrubs, undershrubs or herbs, sometimes pseudo-parasitical (*Xerococcus*, *Ophryococcus*), glabrous or villose (*Ophryococcus*); leaves opposite or more rarely verticillate, ovate or oblong lanceolate, membranous; petiole various, sometimes elongate; stipules intrapetiolar, often small or caducous or deciduous; flowers[2] in terminal cymes, sometimes axillary, or long and slenderly stipitate (*Euosmia*), or subsessile; cymes contracted many-flowered (*Xerococcus*) or few-flowered (*Ophryococcus*); peduncle sometimes short subfleshy (*Xerococcus*); bracts small or 0, sometimes (*Xerococcus*) with subconcrete flowers.[3] (*Trop. N. and S. America.*[4])

106. **Catesbæa** L.[5]—Flowers (small) 4-merous; receptacle obconical or subcampanulate, sometimes 4-gonal. Lobes of cupular calyx 4, subulate, persistent. Corolla funnel-shaped or cylindrico-campanulate; tube sometimes 4-gonal, short or rather long; throat glabrous; lobes of limb 4, short, imbricate.[6] Stamens 4, inserted at base of corolla; filaments short or rather long; anthers small narrow or rather large (*Phyllacantha*[7]), introrse. Germen 2-celled; cells complete or incomplete; disk epigynous annular; style slender

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[1] Sometimes "4-celled" in *Euosmia*.

[2] Small, white, yellow or red or purplish, sometimes sweet-scented.

[3] Of this genus is certainly *Euosmia aggregata* Spreng. whose inflorescence is few-flowered.

[4] Spec. about 25. Link, Kl. et Ott. *Ic. Pl.* t. 23 (*Higginsia*).—H. B. K. *Nov. Gen. et Sp.* iii. 418 (*Evosmia*).—Griseb. *Fl. Brit. W.-Ind.* 321.—Hemsl. *Diagn. Pl. Nov. Mex.* 30.—Hér. *Hort. Fr.* (1863) t. 8 (*Higginsia*).—*Bot. Mag.* t. 5280, 5346, 5383 (*Higginsia*).—Walp. *Rep.* ii. 515; *Ann.* v. 133 (*Higginsia*, *Xerococcus*), 134 (*Ophryococcus*).

[5] *Gen.* n. 130.—J. *Gen.* 199; *Mém. Mus.* vi. 393.—Gærtn. f. *Fruct.* iii. 67, t. 192.—Rich. *Rub.* 176.—DC. *Prodr.* iv. 400.—Endl. *Gen.* n. 3286.—B. H. *Gen.* ii. 78, n. 140.

[6] Margin sometimes obliquely cut and suddenly attenuate, not truly valvate.

[7] Hook. f. *Gen.* ii. 78, n. 141; *Icon.* t. 1095.—H. Bn. *Bull. Soc. Linn. Par.* 182.

elongate to stigmatose apex, straight or curved, 2-dentate. Ovules in cells ∞, sometimes few,[1] descending from placenta, sometimes 2-seriate. Fruit ovoid or globose (small), baccate coriaceous; seeds compressed or angular; testa often granular; albumen fleshy; embryo small.—Glabrous spinous shrubs; branches spinescent rigid terete or sometimes (*Phyllacantha*) straight, vertically compressed, 3-angular;[2] leaves opposite small, very small or 0 (*Phyllacantha*); stipules interpetiolar minute, deciduous; flowers[3] axillary solitary, pedunculate, erect or oftener pendulous.[4] (*Antilles.*[5])

107. **Gonzalagunia** R. and Pav.[6]—Flowers hermaphrodite or polygamous, 2-morphous; receptacle campanulate or subglobose. Teeth of often short calyx 4, 5, equal or unequal. Tube of funnel-shaped or hypocrateriform corolla short or long; throat constricted or dilated, pubescent or villose; lobes of limb 4, 5, variously imbricate, sometimes valvate at base, finally open. Stamens 4, 5, inserted in tube or throat; filaments short; anthers dorsifixed; cells free at base, introrsely rimose. Germen 2–4-celled; cells complete or incomplete; disk more or less elevated, often crenate; style slender, at apex stigmatose enclosed or exserted, 2–4-lobed. Ovules ∞, inserted on axile peltate placenta. Fruit fleshy or coriaceous subglobose;[7] cells or pyrenes 2–4, ∞-spermous. Seeds small, variously foveolate or reticulate; embryo short richly albuminous.—Small trees, shrubs or herbs, erect or twining, glabrous or variously clothed; leaves opposite entire or subcrenulate; stipules interpetiolar; flowers[8] in terminal, simple or ramose, generally elongate spikes or racemes; pedicels bracteolate.[9] (*Trop. N. and S. America.*[10])

108. **Isertia** Schreb.[11]—Flowers hermaphrodite; receptacle sub-

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[1] To 8 in *C. parviflora.*

[2] As in some *Colletias.*

[3] Large or very small, white.

[4] Flowers as regards perianth like those of *Chiococca*, as also ∞-ovulate germen.

[5] Spec. 6, 7. Lamk. *Ill.* t. 67.—Poir. *Dict.* Suppl. vii. 10 (*Scolosanthus*).—Vahl, *Ecl. Amer.* t. 10.—Griseb. *Fl. Brit. W.-Ind.* 317; *Cat. Pl. Cub.* 122.—Linbl. *Bot. Reg.* t. 858.—Sims, *Bot. Mag.* t. 131.

[6] *Prodr.* 12, t. 3; *Fl. Per. et Chil.* i. 56, t. 86 (1794).—*Gonzalea* Pers. *Synops.* i. 132 (1805).—J. *Mém. Mus.* vi. 400.—Rich. *Rub.* 156.—DC. *Prodr.* iv. 436.—Endl. *Gen.* n. 3235. B. H. *Gen.* ii. 65 n. 102.—*Buena* Cav. *Anal. Ciene. Nat.* ii. 279 (not Pohl); *Icon.* vi. (1801), 50, t. 571 (1801).

[7] Sometimes finally septicidal.

[8] Small; colour various.

[9] A genus, except in habit, agreeing pretty closely with *Isertia* and separated only on artificial grounds; for the smaller flower is sometimes almost quite the same.

[10] Spec. 10–12. Pav. *Suppl. Quinol.* 84, t. 1, f. a.—H. B. *Pl. Æquin.* t. 64 (*Buena*).—H. B. K. *Nov. Gen. et Sp.* iii. 406 (*Coccocypselum*).—Griseb. *Fl. Brit. W.-Ind.* 321 (*Gonzalea*).—Walp. *Rep.* ii. 490; vi. 53 (*Gonzalea*).

[11] *Gen.* 234.—Gærtn. f. *Fruct.* iii. 60, t. 191.—J. *Mém. Mus.* vi. 399.—Rich. *Rub.* 155, t. 11,

globose, obconical or subcampanulate. Calyx short, entire, sinuate, dentate or shortly 4–6-lobed. Corolla tubular, thick coriaceous, sometimes externally granular or very plicate or tuberculate; throat barbate or villose; lobes of limb short 4–6,[1] valvate or imbricate, sometimes barbate within; alternate sinuses sometimes projecting more or less outwards, 3-angular or auriculate. Stamens equal in number to lobes of corolla, inserted in throat or tube; filaments short; anthers dorsifixed[2] introrse, acute or acuminate, oftener enclosed, 2-rimose. Germen 2-celled (*Cassupa*[3]) or oftener 4–6-celled; disk annular or cupular, sometimes thick; style slender, 2–6-lobed stigmatose at apex; lobes thin or oftener thick, obovoid or plano-convex. Ovules ∞, inserted in axile sometimes 2-lobed placenta. Fruit baccate or drupaceous; cells or pyrenes 2–6, few- or many-seeded. Seeds small, often foveolate; albumen fleshy; embryo terete or clavate. —Trees or shrubs, glabrous or variously clothed; leaves opposite or rarely 3, 4-nate, large coriaceous acuminate, often pale beneath; stipules interpetiolar connate, intrapetiolar or subfree; flowers[4] in terminal compound-cymiferous racemes; pedicels bracteate and bracteolate.[5] (*Trop. America.*[6])

109. **Mussaenda** L.[7]—Flowers hermaphrodite or rarely polygamous; receptacle obconical or oblong, sometimes subhemispherical. Lobes of oftener scarcely gamophyllous calyx 5, 6, short or elongate, erect or recurved, persistent or oftener deciduous; one often produced to a leaflike (coloured) petiolate lamina. Corolla funnel-shaped; tube elongate, externally often sericeous or hirsute, sometimes enlarged above (*Polysolenia*[8]); throat villose or glabrous; lobes of limb 5, or more rarely 6, valvate, sometimes very reduplicate (*Acranthera*[9]). Stamens same in number; filaments inserted more

fig. 2.—DC. *Pr dr.* iv. 437.—Endl. *Gen.* n. 3234. —B. H. *Gen.* ii. 65, n. 101.—*Phosanthus* Rafin. *Ann. Phys.* vi. 82.—*Brignolia* DC. *Prodr.* iv. 444.—*Bruinsmania* Miq. *Linnæa* xvii. 72.

[1] Rarely more numerous.

[2] Sometimes inserted at top of connective, whence as if pendulous.

[3] H. B. *Pl. Æquin.* i. 43, t. 12.—Rich. *Rub.* 170.—DC. *Prodr.* iv. 373.—Endl. *Gen.* n. 3311. —B. H. *Gen.* ii. 65, n. 100 (corolla valvate).

[4] White, yellow, or generally red or coccineous, often rather large showy.

[5] A genus evidently connecting the *Mussaendeæ* and *Hamelieæ* of authors.

[6] Spec. about 15. Vahl, *Ecl.* t. 15.—Aubl. *Guian.* t 123 (*Guettarda*).—Miq. *St. Surinam.* t. 48, 49 (*Bruinsmania*).—Griseb. *Fl. Brit. W.-Ind.* 319.—Walp. *Rep.* ii. 490; vi. 52; *Ann.* ii. 768.

[7] *Gen.* n. 241.—J. *Mém. Mus.* vi. 386.—Gært. *Fruct.* i. t. 28.—Lamk. *Ill.* t. 157.—Rich. *Rub.* 165.—DC. *Prodr.* iv. 370.—Endl. *Gen.* n. 3313. —B. H. *Gen.* ii. 64, n. 98.—Baker, *Fl. Maurit.* 140.—Hook. *Fl. Ind.* iii. 86.—*Landia* Commers. (ex Rich.).—*Belilla* Rheed. *Hort. Malab.* ii. 27, t. 17.—*Spallanzania* DC. *Prodr.* iv. 406 (not Poll. nor Neck.).

[8] Hook. f. *Gen.* ii. 68, n. 109.—Hook. *F. Ind.* iii. 94.

[9] Arn. *Ann. Nat. Hist.* iii. 20.—B. H. *Gen.* ii. 64, n. 99.—Hook. *Fl. Ind.* iii. 92.—*Andrographis* B. Br. *Wall. Cat.* n. 8398.

or less deeply in tube of corolla sometimes at its base, and by means of hairs more or less coalite with tube as far as the throat;[1] anthers dorsifixed or subbasifixed,[2] enclosed, introrse, 2-rimose, free or coherent at margin (*Acranthera*); connective acute or calcarate at apex. Disk epigynous annular, conical or tumid; style slender, at apex clavate, obtuse or acuminate, entire (*Acranthera*), more rarely 2-lobed. Germen 2- or rarely 3-celled; cells complete or incomplete; ovules ∞, inserted on subpeltate or 2-lobed placenta. Fruit oblong, indehiscent, fleshy or coriaceous, more rarely dry and loculicidal. Seeds ∞, small, generally foveolate; albumen fleshy or horny; embryo terete or clavate.—Shrubs, undershrubs or herbs, often pilose, rarely climbing; leaves opposite or rarely verticillate; petiole often short; stipules interpetiolar, free or connate, entire or lacerate, deciduous or persistent; flowers[3] very rarely solitary terminal, generally in terminal more or less compound-ramose cymiferous racemes; cymes sometimes contracted (*Polysolenia*) and crowded in a spurious capitule; bracts and bracteoles various, sometimes deciduous, rarely large or lacerate. (*Trop. reg. of Old World.*[4])

110. **Adenosacme** Wall.[5]—Flowers[6] (nearly of *Mussaenda*) 4–6-merous; receptacle subglobose. Calyx lobes narrow pointed, sometimes glandular-serrate. Corolla tubular; tube pilose within; throat glabrous or pilose; lobes of limb 4–6, 3-angular, valvate or reduplicate. Stamens as many, inserted in tube or throat; filaments short; anthers dorsifixed oblong obtuse, 2-rimose. Germen 2–5-celled; disk epigynous tumid; style slender thickened above; branches 2–5, linear, stigmatose-papillose at sides. Ovules ∞, inserted on peltate placentas.[7] Fruit baccate, fleshy or coriaceous; cells 2–5, ∞-spermous;

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[1] In *Acranthera zeylanica* the filaments, somewhat dilated at base and free, coalesce around style higher in the tube. The filaments of *M. Landiæ* can be easily traced to the bottom of the tube. The same is the case in *M. Reindwardtiana* Miq. and *philippica* Rich. (spec. closely connecting *Acranthera* with the legitimate *Mussaendæ*).

[2] Sometimes versatile.

[3] White or oftener yellow, ochraceous, purplish or azure.

[4] Spec. about 50. Wall. *Pl. As. Rar.* t. 180.—Wight, *Ill.* t 124.—Seem. *Fl. Vit.* 123.—Miq. *Fl. Ind.-Bat.* ii. 211; Suppl. 218, 541; *Ann. Mus. Lugd.-Bat.* iv. 187.—Bak. *Fl. Maur.* 140.—Benth. *Fl. Hongk.* 152.—Bedd. *Ic. Pl. Ind. Or.* i. t. 23–25 (*Acranthera*); *Fl. Sylv.* t. 16, iii.; cxxx.—Thw. *Enum. Pl. Zeyl.* 138.—Kurz. *For. Fl. Brit. Burm.* ii. 55.—Oliv. *Fl. Trop. Afr.* iii. 65.—*Bot. Reg.* t. 517; xxxii. t. 24.—*Bot. Mag.* t. 2099, 5573.—Walp. *Rep.* ii. 77 (*Acranthera*), 521; vi. 76; *Ann.* ii. 798; v. 136.

[5] *Cat.* n. 6280–6282.—Endl. *Gen.* n. 3253.—B. H. *Gen.* ii. 69, n. 112.—Hook. *Fl. Ind.* iii. 95.—*Lawia* Wight, *Calc. Journ. Nat. Hist.*; *Icon.* t. 1070.—*Mycetia* (sect. of *Bertiera*) DC. *Prodr.* iv. 392.—*Menestoria* DC. *Prodr.* iv. 390 (part).

[6] Small or very small, white, yellowish or greenish, sometimes, as in *Randia*, 2-morphous (Clarke).

[7] Coat simple very short.

pericarp indehiscent or finally loculicidal above. Seeds small cuneate or subcubical spotted; embryo minute ovoid albuminous.—Feeble shrubs; bark whitish secedent; leaves opposite oblong acuminate petiolate, membranous, ∞-nerved; stipules interpetiolar entire or 2-dentate, persistent or deciduous; flowers in axillary and terminal compound-2-chotomous open cymiferous or glomeruliferous racemes; pedicels oftener slender; bracts sometimes glandular. (*Trop. mount. Asia, Ind. Archip.*[1])

111. **Sabicea** Aubl.[2]—Flowers hermaphrodite or rarely polygamous; receptacle obconical or hemispherical. Calyx entire truncate (*Patima*[3]), or 3–6-dentate or lobed; lobes sometimes unequal, obtuse or elongate acute; denticules (stipulary?) sometimes interposed. Corolla funnel-shaped or hypocrateriform; tube short or elongate; throat villose or pubescent; lobes of limb 4–6, sometimes sericeous within, short, obtuse or rather long acute (*Patima*), valvate. Stamens as many, inserted in throat or tube of corolla; filaments rather long, short or 0; anthers dorsifixed linear-oblong, introrsely 2-rimose. Germen 2–6-celled; cells[4] complete or incomplete; branches of erect style same in number stigmatiferous linear rather obtuse. Ovules ∞, inserted on tumid axile or parietal 2-lobed placentas. Fruit baccate, coriaceous or fleshy; cells 2–6, polyspermous; seeds minute, sometimes angular; embryo clavate or terete albuminous.—Shrubs or undershrubs, erect or oftener twining, more frequently tomentose; leaves opposite oblong, petiolate or subsessile; stipules intrapetiolar, straight or recurved, often persistent; flowers[5] axillary cymose or glomerulate; cymes sessile or pedunculate, often corymbiform, bracteate; bracteoles sometimes 0.[6] (*Warm America, trop. west. and east. ins. Africa.*[7])

112? **Stipularia** P. Beauv.[8]—Flowers nearly of *Sabicea*,[9] 5-merous;

[1] Spec. 3, 4. Wall. *Roxb. Fl. Ind.* ii. 138 (*Rondeletia*).—Miq. *Fl. Ind.-Bat.* ii. 215; Suppl. 218; *Ann. Mus. Lugd.-Bat.* iv. 239.—Kurz, *For. Fl. Brit. Burm.* ii. 54.—Walp. *Ann.* i. 376 (*Lawia*); v. 135 (*Bertiera*).

[2] *Guian.* i. 192, t. 75, 76.—J. *Mém. Mus.* vi. 400.—Lamk. *Ill.* t. 165.—Rich. *Rub.* 147.—DC. *Prodr.* iv. 439.—Endl. *Gen.* n. 3224.—B. H. *Gen.* ii. 72, n. 121.—*Schwenkfelda* Schreb. *Gen.* 123.—*Schwenkfeldia* W. *Spec.* i. 982.—*Paiva* Vell. *Fl. Flum.* iii. t. 163 (ex Endl.).

[3] Aubl. *Guian.* i. 196, t. 77.—Rich. *Rub.* 150, t. 15, fig. 2.—DC. *Prodr.* iv. 444.—Endl. *Gen.* n. 3232.—B. H. *Gen.* ii. 73, n. 125.

[4] Corolla lobes, while the same in number, opposite.

[5] White, yellow, small.

[6] A genus hence resembling *Manettia*.

[7] Spec. about 30. R. et Pav. *Fl. Per.* ii. t. 200, fig. *a* (*Schwenkfelda*).—Hook. *Icon.* t. 247.—Don, *Gen. Syst.* iii. 605 (*Cephælis*).—Griseb. *Fl. Brit. W.-Ind.* 322; *Cat. Pl. Cub.* 124.—Hiern, *Fl. Trop. Afr.* iii. 74.—Walp. *Rep.* ii. 489; *Ann.* ii. 766.

[8] *Fl. Ow. et Ben.* ii. 26, t. 75 (not Haw.).—Rich. *Rub.* 117.—DC. *Prodr.* iv. 619.—Endl. *Gen.* 566, 2.—B. H. *Gen.* ii. 74, n. 128.

[9] Of which perhaps rather a sect., bracts dilated to an involucre.

calyx subequally-fid. Corolla funnel-shaped; lobes 5, valvate. Stamens inserted at pubescent throat; anthers sessile enclosed. Germen 2-5-celled; cells ∞-ovulate; disk tubular; style branches 2–5, linear. Fruit fleshy or coriaceous-membranous, 2-5-celled; seeds ∞, smooth, sometimes immersed in pulp; embryo subclavate albuminous and other characters of *Sabicea*.—Tomentose or sericeous shrubs; leaves shortly petiolate opposite elongate, ∞-nerved, whitish or fulvous beneath; stipules interpetiolar developed; flowers axillary glomerulate, involucrate with membranous bracts drawn together in a campanulate involucre. (*Trop. west. Africa.*[1])

113. **Schizostigma** Arn.[2]—Flowers oftener 5-merous; receptacle subspherical or obovoid. Calyx lobes foliaceous unequal lanceolate, sometimes long-petiolate (*Pentaloncha*[3]), or some shorter unequal subulate or sublanceolate; others dilated foliaceous venose petiolate (*Temnopterix*[4]), persistent. Corolla tubular or funnel-shaped-hypocrateriform; lobes of limb 5, valvate; throat pubescent or rigidly barbate (*Temnopterix*); tube sometimes surrounded below middle by a barbate ring (*Pentaloncha*). Stamens 5, inserted at middle or top of tube; filaments short or subnil; anthers dorsifixed, linear-oblong, introrse, 2-rimose. Disk epigynous annular, sometimes depressed or hemispherical. Germen 5-celled (or rarely 2–7-celled); style slender, divided above into as many linear obtuse stigmatose branches. Ovules ∞, inserted on more or less tumid placentas affixed to axis of germen and shortly stipitate. Fruit subspherical or ovoid, fleshy or coriaceous. Seeds ∞, small, externally reticulate, foveolate or mucilaginous; albumen fleshy oily; embryo small subclavate.—Glabrous, fuscate-sericeous or hirsute herbs, sometimes decumbent; leaves opposite, oblong, lanceolate or obovate, petiolate; stipules interpetiolar, sometimes broad, entire or lacerate (*Temnopteryx*), sometimes chartaceous (*Pentaloncha*), often persistent; flowers[5] axillary cymose or glomerulate, few or crowded. (*Ceylon, trop. west. Africa.*[6])

114. **Urophyllum** Jack.[7]—Flowers hermaphrodite or 1-sexual;

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[1] Spec. 3. Hiern, *Fl. Trop. Afr.* iii. 79.

[2] *Ann. Nat. Hist.* iii. 20 (not DC.).—Endl. *Gen.* n. 3224[1].—B. H. *Gen.* ii. 72, n. 122.—Hook. *Fl. Ind.* iii. 100.

[3] Hook. f. *Gen.* ii. 73, n. 124.

[4] Hook. f. *Gen.* ii. 72, n. 123.

[5] Rather large or sometimes (*Pentaloncha*) small.

[6] Spec. 3. Bedd. *Icon. Pl. Ind. Or.* i. t. 95.—Thw. *Enum. Pl. Zeyl.* 132.—Hiern, *Fl. Trop. Afr.* iii. 78 (*Temnopteryx*), 79 (*Pentaloncha*).—Walp. *Rep.* vi. 50.

[7] Ex Wall. *Roxb. Fl. Ind.* (ed. Car.) ii. 184.—Rich. *Rub.* 212.—DC. *Prodr.* iv. 441.—Endl. *Gen.* n. 3227.—B. H. *Gen.* ii. 71, n. 120.—*Axanthes* Bl. *Bijdr.* 1002.—DC. *Prodr.* iv. 440.—

receptacle subglobose or obconical. Calyx cupular, 5- or more rarely 6, 7-dentate. Corolla short-funnel-shaped, subrotate or suburceolate (*Pauridiantha*[1]); lobes valvate, 3-angular, generally 5 (more rarely 6, 7); throat villose. Stamens 5–7, inserted in throat; filaments short; anthers small dorsifixed oblong apiculate, enclosed or more rarely exserted (in female flower smaller or sterile). Germen (in male flower small effete) subinferior; cells 3–5–7, or more rarely 2 (*Pauridiantha*); disk epigynous various, oftener tumid, sulcate or obtusely lobed; style erect, sometimes tumid to middle or to base, at apex stigmatose more or less dilated, subglobose, ovoid or clavate, obtusely or more or less deeply 2–7-lobed. Ovules ∞, minute, inserted on placentas affixed to axis of ovarium, shortly stipitate, sometimes ascending. Fruit small, baccate or coriaceous, 2–7-celled; seeds crowded small subglobose, foveolate or reticulate, richly albuminous.—Glabrous, tomentose or strigose shrubs; leaves opposite petiolate, elliptico- or oblong-lanceolate, often acuminate; stipules various, intra- or interpetiolar, sometimes large; flowers[2] in axillary sessile or pedunculate, many-flowered or sometimes (*Pauridiantha*) 1-flowered cymes. (*Trop. Asia and Oceania, trop. west. Africa, Madagascar.*[3])

115 ? **Aulacodiscus** Hook. f.[4]—Flowers 1-sexual or polygamous, 6–16-merous; receptacle cupular, enclosing adnate base of germen. Calyx short truncate, obtusely sinuate or dentate. Petals of short subrotate corolla 6–16, generally subfree, 3-angular, cohering by means of staminal filaments, valvate; apex inflexed. Stamens as many alternate; filaments subperigynous, much incurved in bud, subfree; anthers short dorsifixed, introrsely 2-rimose (in female flower sterile very small or 0). Germen great part inferior, crowned with thick superior prominently 6–10-lobed disk, 6–16-celled (in female flower small, sterile); style inserted at bottom of disk cavity and subenclosed, broad-obconical, at apex widely peltate-6–16-lobed. Ovules ∞, minute, inserted on rather prominent thick axile placentas.

Endl. *Gen.* n. 3226.—*Wallichia* Reinw. ex Bl. *Flora* (1825), 107 (not DC.).—Hook. *Fl. Ind.* iii. 97.—? *Axanthopsis* Korth. *Ned. Kruidk. Arch.* ii. 195 (ex Miq.).—*Cymclonema* Presl, *Epimel.* 210.

[1] Hook. f. *Gen.* ii. 69, n. 114.

[2] Small or very small.

[3] Spec. about 30. Wight, *Icon.* t. 1163-1165 (*Axanthes*).—Miq. *Fl. Ind.-Bat.* ii. 222, 355; Suppl. i. 219, 542.—Bedd. *Fl. Silv.* t. 16, v.; cxxxi.—Thw. *Enum. Pl. Zeyl.* 139 (*Axanthes*).—Kurz, *For. Fl. Brit. Burm.* ii. 52.—Hiern, *Fl. Trop. Afr.* iii. 71 (*Pauridiantha*), 72.—Walp. *Ann.* i. 375 (*Axanthes*); ii. 767 (*Axanthopsis*).

[4] *Gen.* ii. 71, n. 119.—Hook. *Fl. Ind.* iii. 97.

Fruit baccate, crowned with disk. Seeds ∞, small globose, externally foveolate; albumen fleshy; "embryo small pear-shaped."—Small trees, glabrous or tomentose; leaves opposite oblong petiolate; stipules interpetiolar sub-3-angular acute, caducous; flowers[1] in pedunculate axillary ramose corymbiform cymes.[2] (*Malacca, Java.*[3])

116. **Lecananthus** JACK.[4]—Flowers spuriously capitate; receptacle ovoid or obconical. Calyx wide-campanulate gamophyllous very irregular, 2-lipped; lips subentire or unequally 2, 3-lobed. Tube of funnel-shaped corolla dilated at base; throat glabrous or pilose; lobes of limb 5, thick above, valvate. Stamens 5, inserted at top of tube; filaments short; anthers dorsifixed narrow; cells introrse, free at base. Germen 2-celled; disk rather thick; apex of slender style stigmatose incrassate, 2-lobed. Ovules ∞, inserted on thick axile placentas. Fruit "membranous, mucilaginous within, 2-celled; placentas many-seeded throughout. Seeds obovoid-wedgelike, obtusely angular; testa rather thick smooth; albumen fleshy; embryo small clavate, 2-fid."—Glabrous climbing shrubs; leaves opposite, petiolate, lanceolate-acuminate; stipules rather large connate in pairs; flowers[5] compound-glomerulate in spurious axillary pedunculate or sessile drooping capitules; involucre "monophyllous." (*Ind. Archip.*[6])

117. **Schradera** VAHL.[7]—Flowers spuriously capitate; receptacle obconical or hemispherical. Calyx short-tubular entire truncate. Tube of hypocrateriform thickly coriaceous corolla more or less elongate; throat villose; lobes of limb 4–10, valvate, incurved at apex, often finally open. Stamens 4–10, inserted in throat; filaments short or subnil; anthers linear dorsifixed, enclosed or exserted; cells introrsely rimose, sometimes free at base. Germen 2–4-celled; disk thick; branches of more or less thickened style 2–4, stigmatose connivent. Ovules ∞, inserted on thick placenta affixed to axis within. Fruit baccate fusiform, 2–4-celled. Seeds ∞, small granular,

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[1] Small, "ebracteate."

[2] A genus very near *Urophyllum*.

[3] Spec. 2, 3.

[4] *Malay. Misc.* ii. n. vii. 83.—WALL. *Roxb. Fl. Ind.* (ed. CAR.) ii. 319.—RICH. *Rub.* 213.—ENDL. *Gen.* n. 3323.—B. H. *Gen.* ii. 73, n. 127.—HOOK. *Fl. Ind.* iii. 100.

[5] "Pale reddish."

[6] Spec. 2, 3. MIQ. *Fl. Ind.-Bat* ii. 153, 199; *Ann. Mus. Lugd.-Bat.* iv. 132.

[7] *Ecl. Amer.* i. 35, t. 5.—RICH. *Rub.* 149.—DC. *Prodr.* iv. 443.—ENDL. *Gen.* n. 3230.—B. H. *Gen.* ii. 66, n. 104.—*Fuchsia* SW. *Prodr.* 62; *Fl. Ind. Occ.* 674 (not L.).—*Urceolaria* COTH *Disp. Veg.* 10 (ex W. *Spec.* ii. 238).

albuminous.—Thick glabrous shrubs;[1] leaves opposite petiolate, elliptico-oblong coriaceous thick; stipules intrapetiolar oblong, connate in a deciduous sheath; flowers[2] in contracted compound capituliform terminal thick-pedunculate cymes; bracts thick connate under inflorescence in a dilated or small involucre.[3] (*Trop. America*,[4] "*Gorgona is.*")

118. **Lucinæa** DC.[5]—Flowers (nearly of *Schradera*) spuriously capitate; calyx entire, sometimes very short. Corolla funnel-shaped, barbate at throat; lobes of limb 4, 5, thick-3-gonal, valvate. Stamens 4, 5, enclosed; filaments short; anthers dorsifixed, obtuse or 2-dentate at apex; cells introrsely rimose, free at base. Germen 2-celled; style branches 2, stigmatose; disk epigynous thick; ovules ∞, inserted on subpeltate ovate placenta. Fruit baccate; seeds ∞, smooth, albuminous.—Glabrous erect or climbing shrubs;[6] leaves opposite petiolate oblong coriaceous; stipules interpetiolar short or intrapetiolar oblong connate; flowers[7] in compound contracted capituliform axillary and terminal, solitary or umbellate cymes.[8] (*Ind. Archip.*[9])

119. **Leucocodon** GARDN.[10]—Flowers spuriously capitate (nearly of *Schradera*), 5-merous; calyx gamophyllous tubular, irregularly fissous above, persistent. Lobes of funnel-shaped corolla 5, valvate, induplicate; throat glabrous. Germen 2-celled; disk orbicular; branches of slender style 2 obtuse, stigmatose within and at revolute margins. Ovules ∞, inserted on subpeltate placenta. Fruit "baccate" oblong. Seeds ∞, compressed or occasionally concave, albuminous. —A climbing epiphytal radicant shrub; leaves opposite oblong petiolate; stipules intrapetiolar oblong large, connate at base, 2-dentate; flowers[11] in contracted capituliform terminal cymes; bracts

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[1] "Subepiphytal (pseudoparasitic);" branches radicant fragile, nigrescent on the decay of the entire plant.

[2] "White," small.

[3] Is *Uncariopsis* (KARST. *Fl. Colomb.* i. 181, t. 90.—B. H. *Gen.* ii. 67, n. 106), a Venezuelan shrub, unknown to us, with "habit of *Morinda*," globose capituliform long pedunculate inflorescence; germen 2-celled; fruit unknown, a sect. of this genus?

[4] Spec. 3, 4. BENTH. *Sulph. Bot.* 106, t. 40.—GRISEB. *Fl. Brit. W.-Ind.* 319; *Cat. Pl. Cub.* 123.—WALP. *Rep.* vi. 51.

[5] *Prodr.* iv. 368.—B. H. *Gen.* ii. 67, n. 10*.—HOOK. *Fl. Ind.* iii. 93.—*Luciaea* ENDL. *Gen.* n. 3283.

[6] Nigrescent on decay.

[7] White, moderate.

[8] Inflorescence and habit of *Morinda*, but flowers free as in *Appunia* and ovules ∞. A genus also very near *Schradera*.

[9] Spec. 2, 3. MIQ. *Fl. Ind.-Bat.* ii. 197; Suppl. 217, 540; *Ann. Mus. Lugd.-Bat.* iv. 187.

[10] *Calc. Journ. Nat. Hist.* vii. 5.—B. H. *Gen.* ii. 67, n. 108.—HOOK. *Fl. Ind.* iii. 93.

[11] Small; white.

connate in a large wide-campanulate involucre[1] under inflorescence. (*Ceylon.*[2])

120. **Didymochlamys** Hook. f.[3]—Flowers spuriously capitate; receptacle obconical. Folioles of 5-partite calyx subunequally lanceolate acuminate. Corolla tubular-campanulate; tube having a ring of hairs within; throat glabrous; lobes of limb 5, very induplicate and introflexed undulate at margins. Stamens 5, inserted at base of corolla tube; filaments very unequal (2 longer); anthers introrse dorsifixed at base apiculate enclosed, 2-rimose. Germen 2-celled; disk short-conical; style slender clavate at 2-dentate stigmatose apex. Ovules ∞, inserted on rather thick ascending placentas. Fruit . . . ?—A low glabrous herb; leaves alternate, 2-stichous, oblique lanceolate acuminate "rather fleshy;" petiole short; stipules "2-form; some minute clawlike bulbous at base, inserted at base of petiole, entire or 2-cuspidate; others (?) remote from petiole lanceolate solitary or 2-nate;" flowers[4] in terminal pedunculate contracted capituliform cymes; involucre under flowers consisting of 2 ovate-cuspidate large membranous (coloured ?) bracts mixed with a few narrow lanceolate bracteoles. (*Columbia.*[5])

121. **Hippotis** R. and Pav.[6]—Flowers generally hermaphrodite; receptacle obovoid. Calyx gamophyllous spathaceous, sometimes fissous or unequally-2, 3-lobed, sometimes large foliaceous and unequally 2-lobed (*Tammsia*[7]), or unequally 3–5-lobed (*Sommera*[8]), persistent. Lobes of funnel-shaped campanulate corolla 4–6, valvate or more or less reduplicate. Stamens as many, inserted at greater or less height in tube; filaments sometimes villose, more or less unequal; anthers more or less highly dorsifixed, introrsely 2-rimose, enclosed or exserted. Germen 2-celled; cells complete or incomplete; disk epigynous orbicular or shortly cupular; branches or lobes of erect style 2, stigmatose obtuse, more or less dilated. Ovules ∞, inserted on more or less tumid and often 2-lobed placentas. Fruit

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[1] Membranous, "white."

[2] Spec. 1. *L. reticulatum* Gardn. — Thw. *Enum. Pl. Zeyl.* 138.—Bedd. *Icon. Pl. Ind. Or.* i. t. 94.

[3] *Icon.* t. 1122; *Gen.* ii. 67, t. 105.

[4] Small, subsessile.

[5] Spec. 1. *D. Whitei* Hook. f.

[6] *Prodr.* 33; *Fl. Per.* ii. 55, t. 201.—J. *Mém. Mus.* vi. 393.—Rich. *Rub.* 175.—DC. *Prodr.* iv. 391.—Endl. *Gen.* n. 3297.—B. H. *Gen.* ii. 70, n. 115.

[7] Karst. *Fl. Colomb.* 179, t. 89.—B. H. *Gen.* ii. 79, n. 144.

[8] Schlchtl, *Linnæa*, ix. 602.—Endl. *Gen.* n. 3316.—B. H. *Gen.* ii. 79, n. 143 (seeds not or rather large).

baccate, sometimes crowned with calyx. Seeds ∞, more or less crowded in a mass, small, unequal-angled; albumen fleshy; radicle of straight or curved embryo elongate; cotyledons suborbicular, ovate or obovate.—Small trees or shrubs, often pilose; leaves opposite petiolate obovate or ovate-lanceolate, striated with crowded veinules; stipules interpetiolar, elongate or lanceolate, oftener caducous or deciduous; flowers[1] axillary in pedunculate, often few-flowered, sometimes 1-flowered cymes. (*Trop. N. and S. America.*[2])

122. **Pentagonia** Benth.[3] — Flowers 5, 6-merous (nearly of *Genipa*); receptacle cylindrical or subcampanulate. Calyx spathaceous-4–6-lobed; lobes equal or unequal, imbricate. Corolla funnel-shaped-tubular, glabrous within or with the tube variously pilose; throat glabrous; lobes of limb 4–6, obtuse thick, valvate. Stamens same in number, inserted at bottom of tube; filaments unequal, often villose at base, straight, flexuose or much recurved; anthers ovate-oblong dorsifixed, often finally reflexed; cells introrsely rimose, free below. Germen 2-celled; disk annular or cupular; style unequally 2-lobed at apex; lobes subovate obtuse complanate stigmatiferous. Ovules ∞, inserted on oblong placentas adnate to septum, ∞-seriate. Fruit "baccate," spherical or ovoid. Seeds ∞, obtuse-angled, albuminous. —Shrubs, sometimes but rarely twining; leaves opposite (large), entire or sometimes pinnatifid,[4] venose-lineate, petiolate; "stipules large lanceolate;" flowers[5] in axillary sessile or pedunculate compound corymbiform cymes, bracteate.[6] (*Trop. America.*[7])

123. **Gouldia** A. Gray.[8]—Flowers generally 4-merous; receptacle obconical or obovoid. Calyx short dentate. Corolla hypocrateriform; lobes 4, thick, 3-angular, valvate.[9] Stamens 4, inserted in tube or throat; filaments short or rather long; anthers dorsifixed elongate introrse, 2-rimose; connective apiculate, oftener exserted. Germen 2-celled; disk annular; branches of slender style 2, linear-acute

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[1] Rather large, white, often odorous; corolla generally sericeous, pilose or pubescent without

[2] Spec. about 10. Karst. *loc. cit.* i. t. 17.—Walp. *Rep.* vi. 77 (*Sommera*).

[3] *Sulph. Bot.* 105, t. 39.—B. H. *Gen.* ii. 78, n. 142.—*Megaphyllum* Spruce, Herb. n. 6230.

[4] Nearly of *Artocarpus incisa*.

[5] Large, red, yellow or greenish.

[6] A genus resembling *Genipa*; corolla valvate.

[7] Spec. 5, 6. Seem. *Her. Bot.* t. 28; *Hook. Lon. Journ.* vii. t. 18.—Hook. f. *Bot. Mag.* t. 5230. —Walp. *Ann.* ii. 798.

[8] *Proc. Amer. Acad.* iv. 310.—B. H. *Gen.* ii. 77, n. 139.

[9] One lobe occasionally somewhat exterior.

stigmatose. Ovules ∞, inserted on an oblong placenta affixed to septum and very shortly stipitate. Fruit baccate or drupaceous, with thin putamen, elongate, sometimes shortly dehiscent at apex. Seeds ∞, small, compressed or angular sometimes subulate, foveolate or smooth, albuminous.—Small trees or shrubs, glabrous or puberulous; leaves opposite petiolate coriaceous; stipules intrapetiolar short connate with petioles; flowers[1] in axillary compound-ramose cymes, sometimes few or solitary.[2] (*Sandwich is.*[3])

124. **Myrioneuron** R. Br.[4]—Flowers hermaphrodite; receptacle subovoid. Calyx lobes 5, elongate-subulate rigid, erect or finally open, persistent. Throat of tubular corolla (shorter than calyx) villose; lobes of limb 5, valvate, erect, externally hispidulous. Stamens 5, inserted in tube; filaments short; anthers dorsifixed narrow obtuse introrse enclosed. Germen 2-celled; disk depressed suborbicular; branches of short style 2, stigmatose, oblong, coherent. Ovules ∞, inserted on a thickish placenta affixed to septum. Fruit baccate or dry coriaceous, crowned with calyx; cocci 2, finally dehiscing inwards. Seeds ∝, angular foveolate albuminous; embryo subclavate.—Shrublets; "bark spongy;" leaves opposite wide petiolate highly nervose and venose; stipules interpetiolar elongate; flowers[5] in terminal or axillary drooping more or less capituliform cymes; bracts crowded lanceolate rigid. (*India*, "*Borneo.*"[6])

125. **Payera** H. Bn.[7]—Flowers (nearly of *Myrioneuron*) oftener 5-merous; receptacle oblong. Lobes of calyx 5, large foliaceous, persistent, imbricate? Lobes of tubular corolla 5, valvate. Stamens 5, enclosed. Germen 2-celled; branches of slender style 2 stigmatose filiform, not dilated. Ovules ∞, inserted on a very shortly stipitate and ascending placenta affixed to septum. Fruit dry (?) coriaceous; seeds ∞, ascending compressed subulate, imbricate;[8] albumen . . . ?—A glabrous glaucescent shrub (?); leaves opposite large, lanceolate

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[1] Small or moderate.

[2] A genus very near *Oldenlandia* sect. *Kadua*, slightly differing in fruit being not or scarcely dehiscent. Perhaps of a different genus is (B. H. *loc. cit.* 78) *G. Romanzoffiana*, flowers solitary, berry large.

[3] Spec. 4, 5? Hook. and Arn. *Beech. Voy. Bot.* 64 (*Petesia*).—Wawr. *Flora* (1875), 274, 294.

[4] *Wall. Cat.* n. 6225.—Endl. *Gen.* 566 (observ. on "genera little known").—B. H. *Gen.* ii. 69, n. 113.

[5] White; fruit white.

[6] Spec. 5, 6. Kurz, *For. Fl. Brit. Burm.* ii. 54.

[7] *Bull. Soc. Linn. Par.* 178.

[8] Immature nigrescent.

(pale), petiolate; stipules interpetiolar large foliaceous; flowers cymose, very shortly pedicellate; cymes contracted terminal at top of axillary ramule bearing in the middle a few leaves or 2 pairs of stipuliform bracts; involucre under flowers rather large consisting of 3 pairs of bracts; the 2 lower, smaller; the 2 intermediate, larger foliaceous; the 2 upper, shorter subcoloured.[1] (*Madagascar.*[2])

126 ? **Gonianera** KORTH.[3]—"Flowers 5-merous; lobes of 5-partite calyx ovate acute, open. Corolla tube short; limb 5-partite, valvate. Stamens 5, inserted in corolla tube; filaments short; anthers linear connivent acute, exserted. Germen elongate angular; disk . . . ?; style terete, clavate stigmatose above; ovules ∞, inserted on cylindrical placentas affixed to septum by means of a lamina. Berry 2-celled; seeds ∞, small compressed.—A small tree; leaves opposite elliptical, long-petiolate; stipules sheathing; flowers axillary bracteate." (*Sumatra.*[4])

127 ? **Lasiostoma** BENTH.[5] — Flowers 4-merous; "receptacle urceolate. Calyx entire, persistent. Tube of funnel-shaped corolla short; throat hispid with membranous scales; lobes of limb 4, at base scaly within, valvate. Stamens 4, inserted in tube, subenclosed." Germen inferior, 2-celled; ovules ∞; disk thick. "Style filiform; stigma clavate." Fruit drupaceous,[6] ∞-spermous.—Glabrous shrubs;[7] ramules thick fleshy; leaves opposite, shortly petiolate, oblong or obovate entire coriaceous thick, scarcely nervate; stipules short sheathing, finally breaking vanishing; "flowers in nodelike axillary sessile capitules; germens merged with bracts within capitule."[8] (*New Ireland, New Guinea.*[9])

128 ? **Praravinia** KORTH.[10]—Flowers polygamous or monœcious; receptacle subcampanulate. Calyx 4–6-partite; folioles widely ovate

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[1] A genus imperfectly known, apparently very near *Myrioneuron*; flowers nearly of *Pentanisia*, but cells ∞-ovulate.

[2] Spec. 1. *P. conspicua* H. BN.

[3] *Ned. Kruidk. Arch.* ii. 183.—B. H. *Gen.* ii. 75, n. 131.—? *Gardeniopsis* MIQ. *Ann. Mus. Lugd.-Bat.* iv. 250, 262 (ex MIQ.).

[4] Spec. 1. *G. glauca* KORTH.—MIQ. *Fl. Ind.-Bat.* ii. 200.

[5] *Hook. Lond. Journ. Bot.* ii. 224.—B. H. *Gen.* ii. 74, n. 130.

[6] Baccate according to distinguished authors; but we have seen the putamen rather hard and tolerably distinct within pericarp, thin maybe.

[7] With habit of some species of *Loranthus* or *Æschynanthus*.

[8] A very doubtful genus; specimens in Kew Herbarium destitute of flowers and otherwise very imperfect.

[9] Spec. 2. WALP. *Rep.* ii. 944; vi. 75.

[10] *Verhandl. Nat. Geschied.* (1839–42) 189, t. 41.—B. H. *Gen.* ii. 75, n. 133.

foliaceous, imbricate, excrescent. Tube of funnel-shaped-campanulate pilose corolla short; lobes of limb 4–6, thick, 3-gonal, valvate. Stamens 8–12,[1] inserted under throat of corolla; filaments short; anthers (in female flower small or sterile) oblong basifixed acuminate. Germen inferior, 4–10-celled (in male flower sterile); disk hemispherical rugose; branches of erect style[2] 4–10, linear radiating recurved. Ovules ∞, inserted on a branched placenta affixed to the internal angle of each cell. Fruit "baccate;" cells filled with mucilage pilose; placentas branched, ∞-spermous; testa of minute seeds crustaceous foveolate; epidermis thin; albumen fleshy; embryo pear-shaped.—A small tree; final twigs pilose; leaves opposite sublanceolate, the younger pilose, petiolate; stipules intrapetiolar oblong (rather large), persistent; flowers[3] axillary; males cymose, 3–6-nate; female solitary; bracts and bracteoles wide foliaceous imbricate and conformed to sepals.[4] (*Borneo.*[5])

IX. OLDENLANDIEÆ.

129. **Oldenlandia** Plum.—Flowers hermaphrodite; receptacle concave. Calyx gamophyllous, entire or oftener 5-dentate or lobed; teeth sometimes 4, or more rarely 6. Corolla rotate, funnel-shaped or shortly hypocrateriform; lobes 4–6, valvate or rarely reduplicate; throat glabrous or variously pilose. Stamens 4–6, inserted at throat or higher; filaments short; anthers dorsifixed, oftener short, exserted, introrse, 2-rimose. Germen adnate to receptacle, inferior or more or less free at apex; disk epigynous various; branches of short or elongate style 2, stigmatose, various, obtuse or pointed, sometimes recurved. Ovules in cells ∞, more rarely few or sometimes 1, 2, inserted on a generally ascending and very shortly stipitate, globose, obovoid or shortly clavate placenta affixed at base of septum or more rarely higher. Fruit 2-coccous, capsular or coriaceous, more rarely externally rather fleshy subglobose, sub-2-dymous, oblong or turbinate, indehiscent or loculicidally or septicidally dehiscent; cocci sometimes indehiscent, solute. Seeds 1–∞, globose, angular, alate or marginate, externally smooth, spotted or granular; albumen copious horny or

[1] Of which 4–6 alternipetalous, as many oppositipetalous.

[2] Nearly of *Sabicea*.

[3] "White," moderate.

[4] A genus analogous to none but *Sabicea*; spurious capitules nearly as in *Morinda*, &c.

[5] Spec. 1. *P. densiflora* Korth.—Miq. *Fl. Ind.-Bat.* ii. 225.

fleshy; cotyledons of small straight or curved embryo ovate or oblong. —Shrubs, undershrubs or herbs; leaves opposite or rarely verticillate, very various, small or large, nerved or enervate; stipules various, often connate with petioles in a sheath, entire, dentate or ciliate-dentate; flowers in variously ramose or spicate, terminal or axillary, sometimes 1-parous cymes, sometimes cymose few or solitary. (*All warm regions.*)—See p. 323.

130 ? **Bouvardia** Salisb.[1]—Flowers 4-merous or more rarely 5-merous; receptacle obovoid or obconical. Calyx lobes 4, 5, ovate or lanceolate, or spathulate; sometimes denticules (stipules ?), solitary or 2-nate, interposed. Lobes of tubular, funnel-shaped or hypocrateriform corolla 4, or more rarely 5, valvate; tube straight or slightly curved (*Heterophyllæa*[2]) glabrous within, or sparsely pilose, sometimes encircled by a ring of hairs; throat sometimes wide. Stamens 4, or more rarely 5, inserted in throat or tube, sometimes at bottom of tube (*Heterophyllæa*); filaments very short, short or elongate; anthers dorsifixed, oftener oblong, introrsely or at margins rimose. Germen inferior, 2-celled; disk various, sometimes pilose; style slender, at apex 2-dentate, 2-fid or 4-ramose, oftener papillose throughout. Ovules ∞, inserted on shortly stipitate obovoid or subpeltate or shortly clavate placenta affixed at middle or oftener at base of septum. Fruit capsular, oftener sub-2-dymous, coriaceous, loculicidal or more rarely septicidal (*Hindsia*[3]). Seeds ∞, peltate, imbricate, expanded to a membranous or rather thick wing; albumen fleshy; embryo small subclavate.—Herbs or oftener shrubs, sometimes pustulate (*Heterophyllæa*); leaves opposite or more rarely verticillate, entire or rarely crenate; stipules entire, dentate, fissous or ciliate; flowers[4] in terminal generally corymbiform cymes. (*Trop. N. and S. America.*[5])

131. **Coccocypselum** P. Br.[6]—Flowers dimorphous (nearly of

[1] *Par. Lond.* ii. 88, t. 88. J. Mém. Mus. vi. 383.—Rich. *Rub.* 191 (part).—DC. *Prodr.* iv. 365.—Endl. *Gen.* n. 3265.—B. H. *Gen.* ii. 36, n. 22.—? *Christima* Rafin. *Ann. Gén. Sc. Phys.* v. 224.—*Æginetia* Cav. *Icon.* vi. 51, t. 572 (not L.).

[2] Hook. f. *Icon.* t. 1134.—B. H. *Gen.* ii 37, n. 23 (stock imperfectly known and referred here not without doubt).

[3] Benth. *Lindl. Bot. Reg.* (1844) t. 40.—B. H. *Gen.* ii. 37, n. 25.—*Macrosiphon* Miq. *Linnæa*, xix. 442.

[4] Rather large or large, generally showy, white, yellow, pink, violet or red, sometimes sweet-scented.

[5] Spec. about 30. Jacq. *Hort. Schœnbr.* t. 257 (*Ixora*).—H. B. K. *Nov. Gen. et Sp.* iii. 383, t. 288.—Lindl. *Journ. Hort. Soc.* iii. 246.—Andr. *Bot. Rep.* t. 106 (*Houstonia*).—*Bot. Reg.* (1840) t. 37; (1846), t. 32.—*Bot. Mag.* t. 1854, 3781, 3953, 3977 (*Rondeletia*), 4135 (*Rondeletia*), 4223, 4579.—Walp. *Rep.* ii. 507; vi. 60 (*Hindsia*), 62; *Ann.* i. 377; ii. 778; v. 125.

[6] *Jam.* 1 : 4, t. 6, fig. 2 (*Coccocypsilum*).—Sw. *Fl. Ind. Occ.* i. 245.—Rich. *Rub.* 179 (*Coccocyp-*

Oldenlandia), 4-merous; calyx lobes pointed or lanceolate, persistent. Lobes of shortly funnel-shaped corolla 4, valvate. Stamens 4, inserted in throat; filaments short; anthers oblong, dorsifixed above base; cells free at base, introrsely rimose, enclosed or shortly exserted. Germen 2-celled; disk epigynous 2-lobed; branches of slender style 2. Ovules in cells ∞, inserted on a subglobose short or long stipitate, transverse or ascending placenta affixed at middle or base of septum. Fruit[1] baccate or subdry, sometimes finally 2-partible. Seeds ∞, plano-convex; hilum ventral; testa smooth or granular; albumen fleshy; embryo small, oblique or transverse.—Diffuse ramose creeping herbs, glabrous or oftener tomentose or villose; leaves opposite; petioles short or elongate; stipules solitary on both sides; flowers[2] spuriously capitate at top of axillary peduncle, compound-glomerulate, bracteate. (*Trop. America.*[3])

132. **Synaptantha** Hook. f.[4]—Flowers (nearly of *Oldenlandia*) 4-merous; receptacle concave hemispherical. Lobes of marginally inserted calyx 4, linear, persistent. Corolla rotate; tube very short; petals ovate-acute, free or scarcely connate at base, valvate. Stamens 4, alternipetalous; filaments subfree, inserted in receptacle, subulate; anthers ovate dorsifixed introrse, 2-rimose. Germen adnate to receptacle to middle, free above, 2-celled; style erect, at minute apex capitately 2-lobed stigmatose. Ovules ∞, inserted on subglobose peltate stipitate placenta affixed to middle of septum. Fruit capsular, free to middle, girt to middle with persistent calyx and corolla, locu-licidally 2-valved. Seeds ∞, small angular plano-convex smooth, albuminous; cotyledons of terete embryo oblong.—Perennial ramose puberulous herbs;[5] leaves opposite linear-oblong; stipules small, 2-dentate, connate with petioles; flowers[6] axillary, solitary, 2-nate or few cymose. (*Subtrop. Australia.*[7])

133. **Mitreola** L.[8]—Flowers (nearly of *Oldenlandia* or *Hekistocarpa*)

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silum).—DC. *Prodr.* iv. 396.—Endl. *Gen.* n. 3291.—B. H. *Gen.* ii. 73, n. 126.—*Sicelium* P. Br. *loc. cit.* 144.—*Tontanea* Aubl. *Guian.* i. 108, t. 42.—*Bellardia* Schreb. *Gen.* n. 1723.—*Condalia* R. et Pav. *Prodr.* 11, t. 2 (not Cav.)—*Lipostoma* Don, *Edin. Phil. Journ.* (1830) i. 168.

[1] Azure or violet.

[2] Purple or bluish.

[3] Spec. about 15. H. B K. *Nov. Gen. et Sp.* iii. 403.—Ch. et Schlchtl, *Linnæa*, iv. 138.—Gris. *Fl. Brit. W.-Ind.* 322.—*Bot. Mag.* t. 2840 (*Hedyotis*).—Walp. *Rep.* ii. 516; vi. 72.

[4] *Icon.* t. 1146.—B. H. *Gen.* ii. 61, n. 89.

[5] Habit of "*Sagina*."

[6] Minute, "reddish-white."

[7] Spec. 1. *S. tillæacea* Hook. f.—*Hedyotis tillæacea* F. Muell. *Fragm. Phyt. Aust.* iv. 39.—Benth. *Fl. Austral.* iii. 405, n. 7.

[8] *Hort. Cliff.* 492; *Gen.* n. 932 (ed. 1737).—R. Br. *Prodr. Fl. N.-Holl.* 450, not.—A. Rich. *Mém. Soc. Hist. Nat. Par.* i. t. 3.—Endl. *Gen.* n. 3567.—A. DC. *Prodr.* ix. 8.—Bur. *Logan.* 60.—Benth. *Journ. Linn. Soc.* i. 90.—B. H. *Gen.* ii. 790, n. 5.—*Cynctonum* Gmel. *Syst* 443 (part).

5-merous; receptacle minute very shortly cupular. Sepals 5, lanceolate. Corolla urceolate or subrotate, tube short sometimes ventricose, sometimes slightly contracted above; lobes of limb 5, short, valvate. Stamens 5, small, enclosed in tube; filaments short; anthers ovately cordate. Germen adnate to receptacular cupule only at base or to middle, remainder free, rather broad to apex, 2-celled; branches of short style 2, capitellate at stigmatose apex, finally open or recurved. Placentas and ovules ∞ (of *Oldenlandia*). Fruit capsular almost entirely free, compressed contrary to septum, obcordate or at apex truncate or broadly 2-lobed or sub-2-dymous; cells 2, divergent at apex and dehiscing inwards at margin. Seeds small, globose, ovoid or compressed, tuberculate- or papillose-rugose; albumen fleshy; cotyledons of linear embryo small. Other characters of *Oldenlandia*.—Annual or perennial herbs, erect or creeping at base; leaves opposite membranous; petioles dilated at base to a membrane connate with obtuse or little prominent stipules; flowers in terminal cymes;[1] cymes 2-parous or 1-parous above; flowers sessile or shortly pedicellate, 1-lateral.[2] (*Warm America, Asia and Oceania.*[3])

134 ? **Polypremum** L.[4]—Flowers (nearly of *Oldenlandia* or *Mitreola*) 5-merous or often 4-merous; receptacle shortly cupular. Sepals ovate-lanceolate somewhat rigid. Corolla perigynous with and subequal to calyx or shorter tubular subcampanulate; throat slightly villose or subglabrous; lobes short obtuse, imbricate. Stamens 4, or more rarely 5, inserted in tube of corolla enclosed; filaments short; anthers ovate dorsifixed introrse, 2-rimose. Germen adnate to receptacle at base, above in great part free, 2-celled; style short, at apex stigmatose obtuse entire or very shortly 2-lobed. Ovules ∞, inserted on an ascending placenta affixed to base of septum. Fruit capsular, slightly compressed contrary to septum, finally loculicidal generally septicidal; seeds ∞, subglobose smooth albuminous; embryo

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[1] Small, white (?).

[2] A genus very near *Oldenlandia* and *Ophiorrhiza* (of which perhaps a sect. ?), from which, as from *Uragoga Gærtnera*, it differs in its fruit being subfree (i.e. smaller than cavity of receptacle).

[3] Spec. 3, 4. L *Spec.* 213 (*Ophiorhiza*).—Ell. *Sketch*, i. 238 (*Ophiorrhiza*).—Don, *Gen. Syst.* iv. 171.—Lamk. *Ill.* t. 107 (*Ophiorrhiza*).—Wight, *Icon.* t. 1600.—Benth. *Fl. Austral.* iv. 349.—Hook. *Icon.* t. 827, 828.—Prog. *Mart. Fl. Bras.* vi. 266, t. 71, 82, fig. 1.—Walp. *Rep.* vi. 496.

[4] *Act. Upsal.* (1741) t. 78; *Gen.* n. 137.—J. *Gen.* 122 (*Scrofulariæ*); *Ann. Mus.* v. 255; *Mém. Mus.* vi. 382.—Lamk. *Ill.* t. 71.—Gærtn. *Fruct.* i. 294, t. 62.—LC. *Prodr.* iv. 434; ix. 1?, 560.—Torr. et Gr. *Fl. N.-Amer.* ii. 46.—Endl. *Gen.* n. 3241.—Bur. *Logan.* 61.—B. H. *Gen.* ii. 791, n. 7.

small straight.—A low glabrous ramose herb; leaves opposite linear, dilated at base to a membranous lamina, entire above or obscurely dentate,[1] and thereby connate; flowers[2] in generally solitary dichotomies, very shortly pedunculate. (*Cent. and N. America.*[3])

135. **Ophiorrhiza** L.[4]—Flowers hermaphrodite or polygamous; receptacle subglobose (*Polyura*[5]), turbinate or compressed-cymbiform, sometimes obconical (*Pakenhamia*[6]). Calyx short; teeth 5, rather remote, acute or obtuse (*Polyura*), persistent around fruit. Corolla tubular funnel-shaped; lobes sometimes winged at back, valvate. Stamens, disk &c. of *Oldenlandia*. Germen adnate to receptacle, sometimes free at apex, 2-celled; branches of slender style 2 stigmatose obtuse or oblong, sometimes capitellate. Ovules in cells ∞, inserted on a subglobose or obovoid ascending placenta affixed to bottom of septum. Fruit capsular subglobose (*Polyura*), obconical (*Pakenhamia*), or oftener much compressed contrary to septum, mitre-shaped, widely 2-lobed or 2-winged, sometimes obcordate, truncate above or sub-2-dymous, dehiscing septicidally (*Polyura*) or loculicidally above; cells sometimes finally solute. Seeds ∞, minute angular, smooth, granular or papillose, richly albuminous; embryo clavate, 2-fid or 2-lobed.—Erect or drooping herbs, sometimes subshrubby; leaves opposite[7] petiolate membranous, sometimes unequal; stipules interpetiolar, solitary or 2-nate; flowers[8] in 2-chotomous or sometimes 1-parous recurved cymes; bracts small or subfoliaceous. (*Trop. and subtrop. Asia and Oceania.*[9])

136. **Spiradiclis** Bl.[10]—Flowers hermaphrodite or polygamous (nearly of *Ophiorrhiza*), 4–5-merous; receptacle subtubular or

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[1] Stipular (?).

[2] Small, white.

[3] Spec. 1. *P. procumbens* L.—*P. Linnæi* Micx. *Fl. Amer.-Bor.* i. 83.—? *P. Schlechtendalii* Walp. *Nov. Acta Nat. Cur.* xix. Suppl. i. 351.—*Linum carolinianum* Petiv. *Gaz.* 9, t. 5.

[4] *Fl. Zeyl.* 402; *Gen.* n. 210.—J. *Gen.* 143 (*Gentianæ*).—Gærtn. *Fruct.* i. 264, t. 55.—Rich. *Rub.* 189.—DC. *Prodr.* iv. 415.—Endl. *Gen.* n. 3245.—B H. *Gen.* ii. 63, n. 95.—Hook. *Fl. Ind.* iii. 77.

[5] Hook. f. *Icon.* t. 1049.—B. H. *Gen.* ii. 62, n. 94.—Hook. *Fl. Ind.* iii. 76.

[6] Clarke *mss.* from oral communic.

[7] Sometimes spuriously verticillate.

[8] Small or rarely rather large, white, greenish, pink or golden.

[9] Spec. about 45. Bl. *Bijdr.* 976.—Gaudich. *Freycin. Voy. Bot.* t. 97.—Wight, *Icon.* t. 1067–1069, 1162.—A. Gray, *Proc. Amer. Acad.* iv. 311.—Seem. *Fl. Vit.* 126.—Miq. *Fl. Ind.-Bat.* ii. 166, 350; Suppl. 539; *Ann. Mus. Lugd.-Bat.* iv. 230.—Benth. *Fl. Austral.* iii. 407; *Fl. Hongk.* 147.—Thw. *Enum. Pl. Zeyl.* 139.—Hance, *Trim. J. urn. Bot.* (1877) 334.—Walp. *Rep.* ii. 502; vi. 57; *Ann.* i. 376; ii. 773.

[10] *Bijdr.* 975.—Rich. *Rub.* 208.—DC. *Prodr.* iv. 418.—Endl. *Gen.* n. 3243.—B. H. *Gen.* ii. 1228, n. 93.—Hook. *Fl. Ind.* iii. 76.—*Plectheca* Wall. *Cat.* n. 6215.—*Selenocera* Zipp. *Linnæa*, xv. 316.

obconical, costate. Lobes of persistent calyx 4, 5, obtuse. Lobes of tubular funnel-shaped corolla 4, 5, valvate, sometimes induplicate; throat glabrous or pilose. Stamens 4, 5, inserted in tube and enclosed. Germen 2-celled; disk epigynous tumid, 2–4-lobed; style slender, at apex stigmatose capitately 2-lobed. Ovules in cells (complete or incomplete) ∞, inserted on an ascending stipitate placenta. Fruit capsular, cylindrical or obovoid, loculicidal; valves sometimes 2-partible. Seeds ∞, angular reticulate; embryo small, rich in albumen. —Annual herbs, glabrous or pubescent; leaves opposite,[1] lanceolate membranous; stipules subulate, solitary on both sides; flowers[2] in racemiform axillary or terminal long-pedunculate cymes, 1-lateral. (*Java, trop. south. Asia.*[3])

137. **Lerchea** L.[4]—Flowers (nearly of *Oldenlandia*) 4, 5-merous; receptacle subglobose or obconical. Calycinal teeth or lobes erect, persistent. Corolla tubular-funnel-shaped; tube sometimes rather short; throat barbate or glabrous (*Xanthophytum*[5]); lobes valvate, open. Stamens 4, 5, inserted at various height in throat or tube of corolla, enclosed; anthers dorsifixed enclosed, sometimes at apex penicillate; cells free at base or also at apex.[6] Germen 2-celled; disk tumid, cylindrical or obconical; lobes of short style 2, stigmatose thick (*Xanthophytum*) or more rarely linear-subulate papillose throughout. Ovules in cells ∞, inserted or a subglobose placenta affixed more or less widely to septum. Fruit globose or sub-2-dymous, separable into 2 crustaceous or coriaceous cocci. Seeds ∞, small angular; testa reticulate, punctate or foveolate; embryo small albuminous.—Shrublets or undershrubs, or red-sericeous; leaves opposite, petiolate ovately or oblong-lanceolate membranous; stipules interpetiolar, persistent; flowers[7] cymose, shortly pedicellate or glomerulate; cymes either axillary to leaves sessile or pedunculate (*Xanthophytum*), or axillary to bracts of an elongate filiform axillar or oftener terminal ramule, bracteolate. (*Java, Borneo, Feejee is.*[8])

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[1] Or spuriously verticillate.

[2] Minute, white or yellow.

[3] Spec. 2. Miq. *Fl. Ind.-Bat.* ii. 160.

[4] *Mantiss.* 155.—Benn. *Horsf. Pl. Jav. Rar.* 98, t. 23.—Endl. *Gen.* n. 3251[1].—B. H. *Gen.* ii. 53, n. 72.—*Codaria* L. *mss.*

[5] Reinw. *Bl. Bijdr.* 989.—Rich. *Rub.* 195.—DC. *Prodr.* iv. 413.—B. H. *Gen.* ii. 53, n. 73.—*Metabolos* DC. (part, not Bl.). — *Sclerococcos* Bartl. *mss.* (ex DC.).

[6] Connective sometimes dilated to a small oblong-spathulate dorsal lamina.

[7] Small or very small.

[8] Spec. 5, 6. Bl. *Bijdr.* 958 (*Chiococca*).—DC. *Prodr.* iv. 436, n. 10 (*Metabolos*).—Miq. *Fl. Ind.-Bat.* ii. 175 (*Xanthophytum*), 176; Suppl. 216; *Ann. Mus. Lugd.-Bat.* iv. 128, 223.—A. Gray, *Proc. Amer. Acad.* iv. 311.

138. **Neurocalyx** Hook.[1]—Flowers 5-merous; receptacle obconical or subspherical, sometimes 5-costate. Calyx large membranous, 5-lobed, subpetaloid, reticulate-veined. Lobes of rotate corolla 5, shorter than calyx, valvate. Stamens 5; filaments short or very short; anthers[2] coalite in a cone, dehiscing inwards. Germen 2-celled; disk depressed; style slender, at apex stigmatose capitellate. Ovules ∞, inserted on placentas peltately affixed to septum. Fruit dry, coriaceous or sometimes rather fleshy, tardily 2-coccous or dividing unequally. Seeds ∞, minute foveolate; embryo minute albuminous. —Annual herbs, glabrous or very pilose;[3] stem simple, sometimes very short; leaves opposite, sometimes compact rosulate, entire or dentate, venose; stipules interpetiolar membranous, 2-plurifid; flowers[4] in very short axillary drooping racemes; bracts entire or 2-partite. (*Indian penins., Ceylon, Borneo.*[5])

139. **Argostemma** Wall.[6]—Flowers 4, 5-merous (nearly of *Neurocalyx*); receptacle hemispherical, subcampanulate or obconical. Calyx gamophyllous subrotate or shortly campanulate; lobes 4, 5, or rarely 6, 7, 3-angular. Corolla rotate; lobes 4, 5, open or recurved, 3-angular, valvate. Stamens 4, 5, inserted at bottom of corolla; filaments short; anthers[7] dorsifixed above base, approximate or coherent in a cone, ovate-oblong acuminate or rostrate, rimose within or 1, 2-poricidal at beak. Germen 2-celled; disk epigynous thick; style slender, at apex stigmatose capitellate. Ovules in cells ∞, inserted on a placenta affixed to middle of septum. Fruit capsular, membranous or coriaceous, at apex lacerate or dehiscing pyxis-like. Seeds ∞, small compressed or angular, granulate or reticulate; embryo minute albuminous.—Small, sometimes very small herbs, glabrous or with scattered articulate hairs; leaves opposite,[8] sometimes very few, in each pair equal or very unequal, oblong or lanceolate, membranous or rather fleshy; stipules interpetiolar entire, persistent; flowers[9] in

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[1] *Icon.* t. 174.—Arn. *Ann. Nat. Hist.* iii. 20. —Endl. *Gen.* n. 3287[2].—B. H. *Gen.* ii. 54, n. 76.—Hook. *Fl. Ind.* iii. 46.

[2] Nearly, as corolla, of some *Solanums.*

[3] Habit and sometimes leaves of *Acrotrema.*

[4] Rather large, "pale purple."

[5] Spec. 4, 5. Wight, *Icon.* t. 52.—Thw. *Enum. Pl. Zeyl.* 138.—Walp. *Rep.* ii. 515.

[6] *Roxb. Fl. Ind.* (ed. Car.) ii. 324; *Pl. As. Rar.* t. 185.—Rich. *Rub.* 169.—DC. *Prodr.* iv. 417.—Endl. *Gen.* n. 3244, 3287[1] (Suppl. i. 1394).—B. H. *Gen.* ii. 54, n. 75.—Hook. *Fl. Ind.* iii. 42.—*Pomangium* Reinw. (ex Bl.).—*Cortusoides* Afz. in hb. *Banks.*

[7] Sometimes nearly of *Solanum.*

[8] Or spuriously verticillate.

[9] Small, white, resembling those of the *Solanaceæ, Ardisiæ,* or some *Sonerilæ.*

spurious terminal or oftener axillary umbels (cymes), sometimes in spikelike cymes. (*Trop. Asia, Ind. Archip., Guinea.*[1])

140. **Virecta** Sm.[2]—Flowers 4, 5-merous or more rarely 6, 7-merous; receptacle ovoid or obconical. Calyx lobes equal or unequal, linear or foliaceous, sometimes subspathulate; sometimes 1, 2 denticules (stipular) interposed. Tube of pilose funnel-shaped corolla elongate or slender; throat glabrous or villose[3] (*Pentas*[4]); lobes of limb 4–7, oblong, valvate, finally open. Stamens as many inserted at throat; filaments short or long; anthers dorsifixed, often versatile oblong; cells introrsely rimose, sometimes free at base. Germen 2-celled; disk epigynous, various, simple, entire or lobed, or consisting of 2 free glandules; branches of slender style stigmatose short obtuse or linear papillose throughout (*Pentas*). Ovules ∞, inserted on rather prominent sessile or stipitate placentas affixed to middle of septum. Fruit capsular, coriaceous or membranous; exocarp separable from horny endocarp loculicidal; valves 2, either both persistent (*Pentas*), or one persistent, the other deciduous. Seeds ∞, small, angular, often reticulate; embryo small clavate; albumen fleshy.—Herbs or undershrubs, variously pilose; leaves opposite, petiolate oblong- or ovate-lanceolate; stipules entire, 2-nate or oftener ∞-sect; flowers[5] in terminal corymbiform or umbelliform cymes, bracteate. (*Trop. east. and west. Africa, Madagascar.*[6])

141 ? **Otomeria** Benth.[7]—Flowers (nearly of *Virecta*) 4, 5-merous; calyx lobes unequal (1, 2 larger foliaceous). Tube of corolla slender elongate, dilated above and there staminiferous; throat variously villose or with a ring of hairs; lobes of limb valvate or induplicate.

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[1] Spec. about 25. Wight, *Icon.* t. 1160.—Benn. *Pl. Jav. Rar.* 92, t. 22.—Miq. *Fl. Ind.-Bat.* ii. 160, 348, t. 61; Suppl. i. 215, 539; *Ann. Mus. Lugd.-Bat.* iv. 228.—Hiern, *Fl. Trop. Afr.* iii. 44.—Walp. *Rep.* vi. 72; *Ann.* ii. 791; v. 132.

[2] *Rees Cyclop.* xxxvi. (not L. f.).—DC. *Prodr.* iv. 414.—Endl. *Gen.* n. 3247.—B. H. *Gen.* ii. 55, n. 78.—*Phyteumoides* Smeathm. *mss.* (ex DC.).

[3] Hairs sometimes rigid, rather prominent in an erect crown, obliquely striate, obtuse, collecting the pollen.

[4] Benth. *Bot. Mag.* t. 4086 (1844).—B. H. *Gen.* ii. 54, n. 77.—*Orthostemma* Wall. (ex Voigt, *Hort. Calc.* 384).—*Vignaldia* A. Rich. *Fl. Abyss.* i. 357.—*Neurocarpæa* R. Br. *Salt. Abyss. App.* iv. 64 (part).—Endl. *Gen.* n. 3313, a.

[5] Rather large, showy, white, pink, purplish, lilac or yellow.

[6] Spec. about 10. Forsk. *Fl. Æg.-Arab.* 42 (*Ophiorrhiza*).—Vahl, *Symb.* i. 12 (*Manettia*).—Kl. *Pet. Moss. Bot.* 286 (*Pentanisia*).—Oliv. *Tr. Linn. Soc.* xxix. 82, t. 46 (*Pentas*).—Vatk. *Æst. Bot. Zeitschr.* xxv. 232 (*Pentas*).—Hiern. *Fl. Trop. Afr.* iii. 45 (*Pentas*), 47.—Lindl. *Bot. Reg.* (1844) t. 32 (*Pentas*).—Walp. *Rep.* ii. 57 (*Pentas*), 503; *Ann.* ii. 773 (*Vignaldia*).

[7] *Niger Fl.* 405.—B. H. *Gen.* ii. 55, n. 79.

Stamens enclosed or exserted; anthers dorsifixed elongate introrse. Germen 2-celled; disk thick; branches of slender style 2 stigmatose, short or long. Ovules ∞, inserted on rather prominent oblong placentas affixed to septum. Fruit capsular, obconical or oblong, septicidally 2-coccous; cocci dehiscing inwards, crowned with 2, 3 lobes of calyx. Seeds ∞ &c. of *Virecta*.—Subshrubby, ramose or subsimple herbs; leaves opposite, petiolate, ovate, cordate or oblong membranous; stipules interpetiolar, ∞-setose; flowers[1] in terminal simple or furcate glomerulate spikes; glomerules few- or 2-florous, bracteate.[2] (*Trop. Africa, Madagascar*.[3])

142. **Carlemannia** Benth.[4]—Flowers 4, 5-merous (nearly of *Oldenlandia*); receptacle subglobose. Calyx lobes 4, 5, oblong-lanceolate unequal. Lobes of tubular corolla 4, 5, short, imbricate. Stamens 2, inserted at middle of tube; filaments short; anthers introrse; cells free at base, longitudinally rimose. Germen 2-celled; glandules of disk 2 epigynous, alternating with cells, or 4; lobes of slender clavate style 2, stigmatose, obtuse. Ovules ∞, inserted on an ascending subpeltate placenta affixed to bottom of septum. Fruit capsular subglobose, sometimes sub-4-lobed, membranous, loculicidally 2-valvate. Seeds ∞, minute smooth spotted; embryo small ovoid; albumen copious horny (or "granular").—Ramose herbs, glabrous or pilose; leaves opposite, petiolate obliquely ovate-lanceolate crenate; stipules 0, or transversely linear and connate with petioles, very short; flowers[5] in terminal cymes; branches of inflorescence opposite or very distant alternate. (*Mount. India*.[6])

143. **Silvianthus** Hook. f.[7]—Flowers (nearly of *Carlemannia*) 4, 5-merous; receptacle obconical. Calyx lobes 4, 5, large foliaceous unequal, accrescent after anthesis. Lobes of funnel-shaped corolla 4, induplicate;[8] throat scarcely dilated pilose. Stamens 2, inserted in tube, enclosed; anthers dorsifixed apiculate enclosed.[9] Germen 2-celled; disk epigynous large conical; style papillose at apex

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[1] Small, pink (?).

[2] A genus very near *Virecta* (of which perhaps rather a sect. ?).

[3] Spec. 4, 5. Oliv. *Trans. Linn. Soc.* xxix. 83, t. 47.—Thoms. *Spek. Journ. App.* 636.—? R. Br. *Tuck. Cong. App.* 448 (ex Hiern).—Hiern, *Fl. Trop. Afr.* iii. 49.—Walp. *Ann.* ii. 778.

[4] *Hook. Kew Journ.* v. 307.—B. H. *Gen.* ii. 63, n. 96.—Hook. *Fl. Ind.* iii. 85.

[5] Small, white, "yellowish or pink."

[6] Spec. 2, 3. Walp. *Ann.* v. 115.

[7] *Icon.* t. 1048.—B. H. *Gen.* ii. 64, n. 97.—Hook. *Fl. Ind.* iii. 86.

[8] Subimbricate at apex. Sinus of corolla slightly dilated.

[9] Stipate with very short filament.

fusiform. Ovules ∞, inserted on rather prominent placentas affixed to middle of septum. Fruit capsular rather fleshy, crowned with calyx, "dehiscing at base between its lobes in 5 valves, exposing the placenta." Seeds ∞, oblong imbricate albuminous; "cotyledons of small cylindrical embryo subconnate."—A glabrous ramose shrub; ramules terete; leaves [1] opposite, petiolate, oblong-lanceolate acuminate unequidentate, exstipulate; flowers [2] in dense axillary subsessile cymes, shortly pedicellate, bracteate; bracts oblong obtuse.[3] (*Mount. India.*[4])

X. PORTLANDIEÆ.

144. **Portlandia** P. Br.—Flowers hermaphrodite, 4, 5-merous; receptacle saclike obconical, obovoid or campanulate, enclosing adnate germen. Calyx lobes 4–6, elongate subulate or subfoliaceous, glandulose-denticulate at margins sometimes incurved below, persistent or deciduous (*Coutarea*, *Coutaportla*), valvate or induplicate. Corolla funnel-shaped-campanulate or subclavate; tube generally 5-gonal, straight or sometimes curved; lobes of straight or sometimes oblique limb 4, 5, more rarely 6, at attenuate margin imbricate or subvalvate (*Isidorea*) or reduplicate; throat glabrous. Stamens 4–6, inserted at bottom of corolla tube or higher; filaments generally free except at base where connate in a small ring; anthers basifixed linear-elongate apiculate or muticous, introrse, enclosed or shortly exserted. Germen inferior; cells 2, complete or incomplete; disk epigynous entire or 2-lobed; style filiform, at apex stigmatose entire, 2-dentate or shortly 2-lobed. Ovules in cells ∞, or few, some descending, others ascending (*Coutaportla*), inserted on a rather prominent placenta affixed more or less widely to septum. Fruit capsular, obovoid or obconical, sometimes obcordate, more or less compressed contrary to septum, septicidal (*Tacourea*, *Isidorea*) or loculicidal; valves generally 2-fid or 2-partible above. Seeds ∞, or few, compressed or obtusely angular; margin attenuate (*Euportlandia*, *Isidorea*, *Coutaportla*) or wing margined (*Coutarea*, *Tacourea*); albumen fleshy; cotyledons of rather large embryo ovate or suborbiculate.—Glabrous trees or shrubs; leaves

[1] "Large."
[2] Rather large, "purplish."
[3] Rather a sect. of *Carlemannia ?*
[4] Spec. 1. *S. bracteatus* Hook. f.—*Psychotria* Wall. *Cat.* n. 8367.—? *Neurocalyx* Griff. herb. n. 2880.

opposite, sometimes pungent (*Isidorea*), petiolate; stipules inter- or intrapetiolar, oftener acute; flowers terminal or axillary, solitary or cymose few. (*Both trop. Americas.*)—See p. 331.

145. **Bikkia** REINW.[1]—Flowers (nearly of *Portlandia*) 4, 5-merous; receptacle subcampanulate or longer or shorter obconical. Calyx lobes equal or unequal. Corolla clavate or funnel-shaped-campanulate, 4, 5-gonal; lobes 3-angular, reduplicate-valvate.[2] Stamens as many, inserted at bottom of corolla; anthers elongate basifixed, enclosed or exserted. Germen 4, 5-angular, 2-celled; disk epigynous oftener lobed; style slender, often contorted above, at apex stigmatose obtuse clavate or 2-lobed. Ovules in complete or incomplete cells ∞, inserted externally or internally and externally on short or elongate revolute laminæ of placentas, 2– ∞-seriate, ascending. Fruit capsular obovoid or clavate, septicidal; exocarp[3] separable from endocarp; putamens horny or parchment-like, finally 2-partible. Seeds ∞, compressed or alate at margin; embryo rather large albuminous. Other characters of *Portlandia*.—Glabrous shrubs or small trees; leaves opposite, petiolate, obovate or oblong-lanceolate coriaceous; nerves remote or indistinct; stipules intrapetiolar connate with petioles in a sheath; flowers[4] axillary or terminal, solitary or few cymose. (*Trop. and subtrop. Oceania.*[5])

146. **Morierina** VIEILL.[6]—Flowers (nearly of *Bikkia*) 5-merous; calycinal teeth acute remote. Corolla long tubular-funnel-shaped coriaceous; lobes of limb elongate, valvate, recurved or revolute. Stamens inserted at bottom of tube; filaments free except quite at base; anthers subbasifixed very long exserted. Germen 2-celled; disk thick conical obtuse-lobed rather fleshy; style slender subentire, attenuate at base, contorted above exserted, at apex very shortly 2-dentate. Ovules in cells ∞, inserted on 2-lamellate placentas, 2-

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[1] *Bl. Bijdr.* 1017.—DC. *Mém. Omb.* 10; *Prodr.* iv. 405.—RICH. *Rub.* 150.—ENDL. *Gen.* n. 3257.—B. H. *Gen.* ii. 46, n. 52.—*Cormigonus* RAFIN. *Ann. Gén. Sc. Phys.* vi. 83.—*Bikkiopsis* BR. et GR. *Bull. Soc. Bot. Fr.* xii. 404; *Ann. Sc. Nat.* ser. 5, vi. 254.—*Tatea* SEEM. *Fl. Vit.* 125.—*Grisia* AD. BR. *Bull. Soc. Bot. Fr.* xii. 405; *Ann. Sc. Nat.* ser. 5, vi. 255; xiii. 400; *Nouv. Arch. Mus.* iv. 38, t. 15.

[2] Sinuses sometimes projecting.

[3] DUCHARTRE (*Elém.* ed. 2, 673) mistook the exterior membrane of the pericarp for carpels; his description of the inferior germen is hence incongruous.

[4] Large, showy, white, yellow or pink.

[5] Spec. about 10. FORST. *Prodr.* n. 86 (*Portlandia*).—W. *Spec.* i. 935 (*Portlandia*).—SPRENG. *Syst.* i. 416 (*Hoffmannia*).—MIQ. *Fl. Ind.-Bat.* ii. 156.—A. GRAY, *Proc. Amer. Acad.* iv. 307.

[6] *Bull. Soc. Linn. Normand.* (1865).—B. H. *Gen.* ii. 47, n. 53.

seriate, transversely compressed and superposed. Fruit capsular clavate; exocarp finally separable from endocarp. Seeds ∞, orbicular compressed subtransverse reticulate, thick-winged at margin, albuminous.—Glabrous shrubs; leaves opposite obovate-lanceolate coriaceous nearly veinless petiolate; stipules short connate with petioles in a sheath; flowers [1] in terminal corymbiform cymes, minutely bracteate.[2] (*N. Caledonia.*[3])

147. **Condaminea** DC.[4] — Flowers hermaphrodite; receptacle subcampanulate. Calyx gamophyllous, widely tubular or campanulate, unequally 2–6-dentate or lobed, coriaceous, at base circumscissile deciduous. Corolla funnel-shaped-campanulate coriaceous; throat villose; lobes of limb 5, 6, thickened at apex, valvate, recurved. Stamens 5, 6, inserted in tube; filaments thick; anthers dorsifixed oblong introrse exserted. Germen 2-celled; disk epigynous orbicular-depressed; branches of exserted sometimes subclavate style everywhere papillose-stigmatose recurved. Ovules ∞, inserted on a longitudinal rather prominent placenta. Fruit capsular turbinate coriaceous, areolate at apex, loculicidal from apex; valves finally recurved. Seeds ∞, small subtransverse cuneate; testa loosely reticulate; cotyledons of clavate embryo plano-convex; radicle obtuse; albumen fleshy.—Small trees or shrubs; branches compressed; leaves opposite (large), petiolate, oblong acuminate, generally cordate at base, coriaceous nervose; stipules intrapetiolar large chartaceous venose, 2-partite; flowers [5] in long-pedunculate compound-3-parous cymes, ebracteolate; pedicels thick. (*South. trop. America.*[6])

148. **Rustia** Kl.[7]—Flowers 5-merous (nearly of *Condaminea*); receptacle obconical or campanulate. Calyx short cupular, dentate or lobed, sometimes subentire. Lobes of funnel-shaped-campanulate corolla 5, glabrous or tomentose, valvate, recurved or open; throat glabrous or villose. Stamens inserted under throat; filaments subulate or 3-angular, often barbate at base; anthers basifixed, often 4-gonal,

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[1] Large, showy, white.

[2] A genus very near *Bikkia* (of which perhaps better a sect.).

[3] Spec. 1 (v. 2?). Ad. Br. et Gr. *Ann. Sc. Nat.* ser. 5, vi 255; xiii. 401.

[4] *Prodr.* iv. 402.—Endl. *Gen.* n. 3262.—B. H. *Gen.* ii. 44, n. 47.

[5] Large, white, purplish or brown, often showy.

[6] Spec. about 4. R. et Pav. *Fl. Per. et Chil.* ii. t. 188–190 (*Macrocnemum*).—H. B. K. *Nov. Gen. et Sp.* iii. 399 (*Macrocnemum*).—Pœpp. et Endl. *Nov. Gen. et Sp.* iii. 30.—Walp. *Rep.* ii. 507.

[7] *Hayn. Arzn.* xiv. sub t. 14.—B. H. *Gen.* ii. 45, n. 49.—*Tresanthera* Karst. *Fl. Colomb.* 37, t. 19.—*Henlea* Karst. *loc. cit.* 157, t. 78.

elongate, poricidal or shortly rimose, enclosed or exserted. Germen 2-celled; disk thick entire or obtusely lobed; lobes of rather thick clavate obtuse style stigmatose very short or scarcely perceptible. Ovules ∞, inserted ∞-seriately on longitudinal placentas, minute. Fruit capsular, clavate or oblong-obovoid, loculicidal. Seeds ∞, crowded subhorizontal (very small), compressed or marginate; embryo small albuminous.—Glabrous trees; leaves opposite lanceolate coriaceous, petiolate; stipules intrapetiolar (large) oblong or sublanceolate, caducous; "axils glandulous;" flowers[1] in terminal compound-racemose cymes, bracteolate. (*Trop. America.*[2])

149. **Pinckneya** L.-C. Rich.[3]—Flowers 5-merous; receptacle turbinate. Calyx short; lobes or teeth 5, very dissimilar; the smaller 3, 4, sometimes scarcely visible; the larger 1, 2 (rarely 3) produced to a coloured foliaceous petiolate lamina. Corolla tubular elongate, pilose or villose within, sometimes glabrous below (*Pogonopus*[4]); lobes of limb 5, short, valvate, recurved, glabrous within (*Pogonopus*) or tomentose. Stamens 5; filaments inserted at middle (*Pogonopus*) or base of tube; anthers oblong introrse, exserted, versatile. Germen 2-celled; disk epigynous rather thick; branches of slender exserted style 2, linear oblong, obtuse or very short. Ovules ∞, inserted on 2-lamellate placentas. Fruit capsular obovoid, subglobose (*Pogonopus*) or obcordate-sub-2-dymous (*Eupinckneya*), loculicidally 2-valved; valves 2-partible. Seeds ∞, small compressed or subcuneate; testa rather thick sometimes loosely reticulate, spongy dilated; cotyledons of longish embryo elliptico-ovate; radicle rather obtuse.—Small trees or shrubs, glabrous or tomentose (*Eupinckneya*); leaves opposite (large), petiolate, membranous; stipules interpetiolar pointed deciduous or caducous; flowers[5] in terminal and axillary compound corymbiform cymes, bracteolate. (*North. and trop. America.*[6])

150. **Rondeletia** Plum.[7]—Flowers 4, 5-merous or more rarely

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[1] Rather large, showy (often somewhat resembling those of the *Cinchonas*).

[2] Spec. 5, 6. Walp. *Rep.* vi. 68.

[3] *Michx. Fl. Bor. Amer.* i. 103, t. 13.—Gærtn. f. *Fruct.* iii. 80, t. 194.—Rich. *Rub.* 197.—B. H. *Gen.* ii. 47, 1228, n. 54.—*Pinknea* Pers. *Synops.* i. 197.—*Pinkneya* DC. *Prodr.* iv. 366.—Endl. *Gen.* n. 3264.

[4] Kl. *Mon. Akad. Wiss. Berl.* (1853) 500.—B. H. *Gen.* ii. 47, 1228, n. 55.—*Howardia* Wedd. *Ann. Sc. Nat.* ser. 4, i. 60, t. 10.—*Chrysoxylon* Wedd. *Hist. Nat. Quinq.* 100.

[5] Corollas pink, purple-spotted, showy; sepals pink foliaceous.

[6] Spec. 5, 6. Kl. *loc. cit.* (1859) t. 2 (*Howardia*).—Œrst. *Amer. Centr.* t. 13.—Chapm. *Fl. S. Unit. St.* 179.—Hook. *Bot. Mag.* t. 5110 (*Howardia*).—Walp. *Ann.* v. 124 (*Pogonopus*), 129 (*Howardia*).

[7] *Gen.* 15, t. 12.—L. *Gen.* n. 224 (part).—

(*Stevensia* [1]) 6–8-merous; receptacle subglobose or more rarely obovoid. Calyx lobes lanceolate or linear acute, equal or unequal, persistent; denticules (stipules ?) sometimes interposed. Corolla funnel-shaped or hypocrateriform; tube generally elongate slender; throat glabrous or variously villose, often thickened to a more or less prominent glandular ring; lobes of limb obovate-obtuse, imbricate, patent. Stamens equal in number to lobes, inserted in throat; filaments short or very short; anthers enclosed oblong dorsifixed, introrsely 2-rimose. Germen 2-celled; disk epigynous thick annular or depressed conical; lobes of slender style 2, stigmatose, short, linear or elliptical, patulous. Ovules in cells ∞, inserted on thick sometimes globose short-stipitate placentas affixed to septum. Fruit capsular various, oblong or globose, coriaceous or chartaceous, loculicidal; valves 2-partible. Seeds ∞, minute, various in form, angular, subcubical or sometimes compressed, marginately winged or fusiform; coat produced both ways to a point; embryo small albuminous.—Trees or shrubs, glabrous pubescent or white-arachnoid-villosulous (*Arachnothryx* [2]); leaves opposite or rarely verticillate, sessile or petiolate, membranous or coriaceous; stipules interpetiolar, simple or 2-nate (*Rogiera* [3]), sometimes minutely glanduliferous, deciduous or persistent; flowers [4] in compound racemose or corymbiform, axillary or rarely terminal cymes. (*Both trop. Americas.* [5])

151 ? **Rhachicallis** DC.[6]—Flowers of *Rondeletia*, 4-merous; tube of receptacle short. Lobes of persistent calyx 4, elongate; minute denticules interposed. Corolla hypocrateriform; tube straight or slightly curved; throat glabrous; lobes of limb 4, thick, imbricate. Stamens 4, enclosed; filaments short inserted in throat; anthers dorsifixed oblong. Germen adnate to receptacle below, above free,

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Lamk. *Ill.* t. 162.—Gærtn. f. *Fruct.* iii. 38, t. 184.—Rich. *Rub.* 190.—DC. *Prodr.* iv. 406 (part).—Endl. *Gen.* n. 3254.—B. H. *Gen.* ii. 224, 1228, n. 58.—*Petesia* P. Br. *Jam.* 143, t. 2, 3 (part).—DC. *Prodr.* iv. 395.—*Lightfootia* Schreb. *Gen.* 122 (not Lhér.).—*Willdenowia* Gmel. *Syst.* ii. 362 (not Cav. nor Thunb.).—*Arachnimorpha* Desvx. *Ham. Prodr.* 28.

[1] Poit. *Ann. Mus.* iv. 235, t. 60 (not Neck.).—Gærtn. f. *Fruct.* iii. t. 97.—DC. *Prodr.* iv. 349.—Rich. *Rub.* 205.—Endl. *Gen.* n. 3279.—Turp. *Dict. Sc. Nat.* Atl. t. 101.—Griseb. *Fl. Brit. W.-Ind.* 328.

[2] Pl. *Fl. des Serres*, v. sub t. 442.

[3] Pl. *loc. cit.* t. 442.

[4] Moderate, showy, white, pink, yellow, coccineous or red, sometimes odorous.

[5] Spec. about 50. Jacq. *Amer.* t. 42.—Vahl, *Symb.* iii. t. 54.—H. B. K. *Nov. Gen. et Sp.* iii. t. 290, 291.—Griseb. *Fl. Brit. W.-Ind.* 325; *Cat. Pl. Cub.* 127.—Hemsl. *Diag. Pl. Mex.* 25.—Kst. *Fl. Col.* t. 96.—Lindl. *Bot. Reg.* t. 1905.—*Bot. Mag.* t. 3953, 3977, 4579, 5669, 6290.—Walp. *Rep.* ii. 505, 943; vi. 59; *Ann.* i. 377; v. 117.

[6] *Prodr.* iv. 434, n. 2 (excl. 1, 3).—B. H. *Gen.* ii. 49, n. 59.

2-celled; disk epigynous thin, white-sericeous; style branches 2, stigmatose, recurved rather obtuse. Ovules ∞, or few, inserted on a saucer-shaped placenta peltately affixed to septum. Capsule oblong, semi-superior, septicidal. Seeds ∞, angular foveolate, albuminous (?). —A low ramose hoary shrublet;[1] leaves opposite (small), rather fleshy, imbricately compacted; stipules connate with petioles in a coriaceous sheath ciliate above; flowers[2] axillary solitary subsessile, partly immerged in sheath; bracts 2, lateral, similar to laciniæ of calyx.[3] (*Antilles.*[4])

152. **Bathysa** PRESL.[5]—Flowers hermaphrodite or polygamous; receptacle obovoid. Calyx short cupular, 4, 5-dentate, persistent or deciduous. Tube of funnel-shaped corolla short; throat villose; lobes 4, 5, oblong, imbricate. Stamens as many, inserted at mouth of corolla; filaments subulate elongate, glabrous (*Voightia*[6]) or barbate (*Schœnleinia*[7]); anthers short dorsifixed exserted, introrsely 2-rimose; connective sometimes thickened at back. Germen inferior 2-celled; disk epigynous annular or 2-lobed; style thick, attenuate to base; branches 2 short stigmatose. Ovules ∞, inserted on a placenta adnate to septum. Fruit capsular (small) obovoid-truncate, septicidal from apex; valves 2-fid above. Seeds ∞, inserted on placentas finally free, small compressed or angular reticulate, sometimes narrow marginate; embryo small clavate, albuminous.—Trees or shrubs, glabrous or oftener tomentose;[8] leaves opposite, petiolate, ovate or lanceolate; stipules interpetiolar various, deciduous; flowers[9] sessile or very shortly pedicellate in the brachiate branches of a compound terminal raceme, solitary or glomerulate. (*Brazil.*[10])

153. **Wendlandia** BARTL.[11]—Flowers[12] hermaphrodite or polygamous (nearly of *Rondeletia*); receptacle small subglobose. Calyx

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[1] Habit of *Passerina*.

[2] Small, yellow, sericeous.

[3] Perhaps, from its singular habit and germen not quite inferior, better a sect. of *Rondeletia*, by the intervention of *R. phyllanthoides* GRISEB. in which the fruit is quite inferior and seeds pointed and winged on both sides?

[4] Spec. 1. *R. rupestris* DC.—GRISEB. *Fl. Brit. W.-Ind.* 330.—*Hedyotis rupestris* SW. *Prodr.* 29. —H. B. K. *Nov. Gen. et Sp.* iii. 391.—*H. americana* JACQ. *Amer.* 20.

[5] *Bot. Bem.* 84.—B. H. *Gen.* ii. 49, n. 60.

[6] KL. *Hayn. Arzn.* xiv. sub t. 15 (not ROTH. nor SPRENG.).

[7] KL. *loc. cit.*

[8] Leaves, calyx, bracts and fruit clothed with same tomentum.

[9] Small, not handsome.

[10] Spec. 5, 6. A. S.-H. *Pl. Us. Bras.* t. 3, A, B (*Exostema*).—VELL. *Fl. Flum.* 63, Atl. ii. t. 17 (*Coffea*).—RICH. *Rub.* 200, 201 (*Macrocnemum*).—WALP. *Rep.* vi. 59, 69 (*Voightia*), 70 (*Schœnleinia*).

[11] Ex DC. *Prodr.* iv. 411 (part, not W.).—ENDL. *Gen.* n. 3252.—B. H. *Gen.* ii. 50, n. 62.—HOOK. *Fl. Ind.* iii. 37.—*Rhombospora* MIQ. *Fl. Ind.-Bat.* ii. 345.—*Sestinia* BOISS. et HOHEN. *Kotsch. Pl. Exs.* n. 571.

[12] Often 2-morphous.

lobes 4, 5, equal or unequal, elongate or subulate. Tube of funnel-shaped or hypocrateriform corolla narrow, sparsely pilose within, short or long; throat glabrous or pilose; lobes of limb 4, 5, oblong obtuse, imbricate, or rarely contorted, finally open. Stamens 5, inserted in throat; filaments long short or subnil; anthers small dorsifixed versatile, introrsely rimose, enclosed or exserted. Germen 2-celled;[1] style slender, dilated at stigmatose apex, ovoid or subpiriform, subentire, 2-dentate or 2-lobed. Ovules ∞, inserted on subglobose placenta affixed to septum. Fruit capsular subglobose, loculicidal or septicidal. Seeds ∞, compressed reticulate, albuminous, sometimes narrow-winged. Other characters of *Rondeletia*.[2]—Small trees or shrubs; leaves opposite or 3-nate, petiolate or sessile, ovate or oblong; stipules inter- or intrapetiolar, entire, sometimes foliaceous, or 2-lobed, deciduous or persistent; flowers[3] in terminal very ramose glomeruliferous racemes, 1–3-bracteolate. (*Warm Asia.*[4])

154 ? **Chalepophyllum** Hook. f.[5]—Flowers 5-merous; receptacle long-obovoid. Calyx lobes 5, unequal oblong-subspathulate obtuse coriaceous, persistent. Throat of funnel-shaped corolla villose; lobes of limb 5, oblong obtuse, attenuate at margin, imbricate or contorted (?). Stamens inserted in throat; filaments subulate; anthers linear-acute, dorsifixed at base, enclosed; connective thickened at back. Germen 2-celled; disk epigynous thick; branches of slender style 2, short stigmatose. Ovules ∞, inserted on placentas adnate to middle of septum. Fruit "capsular, crowned with calyx, crustaceous, septicidally 2-valvate. Seeds ∞, angular rather compressed subalate reticulate;" embryo . . . ?—A rigid shrublet; ramules puberulous, resinous at apex; leaves opposite, petiolate elliptico-obovate coriaceous fuscate tomentellose beneath, nervate and thickly reticulate; stipules interpetiolar short, persistent; flowers axillary solitary; peduncle short, 2-bracteolate.[6] (*Guiana.*[7])

155. **Augusta** Pohl.[8]—Flowers 5-merous; receptacle longer or

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[1] Rarely 3-celled.

[2] To which very near.

[3] Small, yellow, white or pink.

[4] Spec. about 12. Roxb. *Fl. Ind.* ii. 133, 140, 141, 142 (*Rondeletia*).—Bl. *Bijdr.* 974 (*Rondeletia*).—Don, *Prodr. Fl. Nepal.* 138 (*Rondeletia*).—Wight and Arn. *Prodr.* i. 402.—Wight, *Icon.* t. 1033.—Miq. *Fl. Ind.-Bat.* ii. 157, 345; *Ann. Mus. Lugd.-Bat.* iv. 221.—Bedd. *Fl. Sylv.* t. 224, cxxx.—Kurz, *For. Fl. Brit. Burm.* ii. 73.—Thw. *Enum. Pl. Zeyl.* 159.—Boiss. *Fl. Or.* iii. 10.—Walp. *Rep.* ii. 504; vi. 58.

[5] *Icon.* t. 1148.—B. H. *Gen.* ii. 50, n. 63.

[6] A genus apparently very near *Rondeletia*, differing chiefly in habit.

[7] Spec. 1. *C. guianense* Hook. f. *loc. cit.*

[8] *Pl. Bras. Icon.* ii. 1, t. 101–105 (not Leand.).—B. H. *Gen.* ii. 51, n. 66.—*Augustea* DC. *Prodr.* iv. 404.—*Schreibersia* Pohl, *Flora* (1825), 183 (not *Schreibera* Retz.).—Endl. *Gen.* n. 3259.

shorter obovoid, costate or angular; lobes of calyx angular, persistent. Corolla long-funnel-shaped; tube straight or oftener curved, glabrous within; lobes of limb 5, contorted, open. Stamens 5; anthers subsessile dorsifixed oblong, exserted. Germen 2-celled; disk epigynous annular; style thin thickened at apex; lobes 2 ovate-obtuse. Ovules ∞, inserted on placenta longitudinally adnate to septum. Fruit capsular oblong-cylindrical, loculicidal; valves 2-partible; exocarp separable from hard endocarp. Seeds ∞, inserted on thick foveolate placentas, angular, albuminous.—Glabrous trees or shrubs; leaves opposite oblong-lanceolate coriaceous; stipules connate in an intrapetiolar sheath, deciduous; flowers[1] in axillary and subterminal 3-flowered cymes; pedicels bracteolate. (*Warm Brazil.*[2])

156. **Lindenia** Benth.[3]—Flowers 5-merous; receptacle obconical, angular or costate. Sepals 5, subfree, lanceolate or subulate. Corolla long-hypocrateriform; tube slender very elongate; throat glabrous; lobes of limb oblong, contorted, open. Stamens inserted in throat; anthers subsessile oblong, introrsely 2-rimose, exserted. Germen 2-celled; disk epigynous orbicular very inconspicuous; style slender subclavate above; lobes 2, stigmatose-papillose within. Ovules ∞, inserted on elongate short-stipitate placentas affixed to septum. Fruit capsular clavate, crowned with sepals, septicidal; exocarp separable from endocarp; valves placentiferous at margin. Seeds ∞, unequally angular, albuminous.—Glabrous or pubescent shrubs; leaves opposite, lanceolate; petiole short; stipules intrapetiolar subfoliaceous, oblong or lanceolate, sometimes cuspidate, free, persistent, or connate in a sheath; flowers[4] in short terminal few-flowered cymes; pedicels bracteolate. (*Mexico, Feejee is., N. Caledonia.*[5])

157. **Elæagia** Wedd.[6]—Flowers hermaphrodite; receptacle small hemispherical or shortly obconical. Calyx cupular gamophyllous, persistent; lobes short obtuse. Corolla very short-funnel-shaped or

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[1] Resembling those of *Gardenia*; tube longer obconical; showy, coccineous or purplish. Closely allied, apparently, also to *Exostema*.

[2] Spec. 3, 4. Spreng. *Syst.* i. 761, ex Cham. et Schlchtl. *Linnæa* (1819), 181 (*Ucriana*).

[3] *Pl. Hartweg.* 84, 351.—Endl. *Gen.* n. 3259[1] (Suppl. iii. 53).—B. H. *Gen.* ii. 51, n. 64.—*Siphonia* Benth. *loc. cit.* (not Rich.).

[4] Long, showy, white, nearly of *Exostema*, but corolla not imbricate.

[5] Spec. 2. Hook. *Icon.* t. 475, 476; *Bot. Mag.* t. 5258.—Seem. *Fl. Vit.* t. 24.—Ad. Br. *Bull. Soc. Bot. Fr.* xii. 407; *Ann. Sc. Nat.* ser. 5, vi. 258.

[6] *Hist. Nat. Quinq.* 94, not.—B. H. *Gen.* ii. 50, n. 61.

subrotate; throat villose; lobes recurved, contorted. Stamens 5, inserted in tube, exserted; filaments near middle inwardly geniculate-appendiculate and there densely lanuginous; anthers dorsifixed ovate, introrsely 2-rimose. Germen inferior, 2-celled, crowned with depressed disk; style thickened to apex and there divided into 2 short, obtuse stigmatiferous branches. Ovules ∞, inserted on a thick subpeltate placenta. Fruit capsular, loculicidal; valves finally 2-fid. Seeds ∞, inserted on thick foveolate placentas, unequally elongate or angular, compressed; external coat cellulose subalate; embryo . . . ?—Lofty glabrous resinous trees; leaves opposite, petiolate oblong-ovate or subovate, large coriaceous penninerved; stipules intrapetiolar thick connate or free obtuse; flowers[1] in terminal very ramose compound spikes or racemes, sessile or shortly pedicellate, minutely bracteate. (*Peru, N. Granada.*[2])

158. **Greenea** W. and Arn.[3]—Flowers 4, 5-merous; receptacle subglobose. Calyx lobes short acute, persistent. Corolla funnel-shaped; tube long, glabrous within; lobes of limb ovate, contorted. Stamens 4, 5, inserted in throat; filaments short; anthers dorsifixed exserted; cells introrse exserted, free at base and apex. Germen 2-celled;[4] disk thin or 0; branches of slender style 2, stigmatose within, recurved or revolute. Ovules ∞, inserted on a hemispherical placenta peltately affixed to septum. Fruit capsular subglobose (small), septicidal; valves 2-partible; exocarp separable from endocarp. Seeds ∞, inserted on free placenta, angular or curved rather compressed reticulate, sometimes narrow-winged, albuminous. Glabrous or pubescent shrubs (sometimes climbing?); leaves opposite or ternate, lanceolate, long-petiolate; stipules interpetiolar various; flowers[5] in cymiferous racemes, often 1-lateral subsessile, ebracteolate.[6] (*Trop. Asia and Oceania.*[7])

159. **Deppea** Cham. and Schlchtl.[8]—Flowers 4-merous; receptacle turbinate. Calyx short, 4-dentate, persistent; teeth equal or

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[1] Small, not handsome.

[2] Spec. 2. Walp. *Ann.* ii. 777.

[3] *Prodr.* i. 403.—Endl. *Gen.* n. 3251 (*Greenia*).—B. H. *Gen.* ii. 51 (*Greenia*), 1228, n. 67.—Hook. *Fl. Ind.* iii. 41.—*Rhombospora* Korth. *Ned. Kruidk. Arch.* ii. 114.

[4] Rarely 3-celled.

[5] Small, white, sericeous.

[6] *G. latifolia* Bl. (known to us only from a very defective specimen) is apparently *Guettarda.*

[7] Spec. 4, 5. Wall. *Roxb. Fl. Ind.* ii. 140 (*Rondeletia*).—DC. *Prodr.* iv. 412, n. 13 (*Wendlandia*).—Wight. *Icon.* t. 1161.—Miq. *Fl. Ind.-Bat.* ii. 156 (part); *Ann. Mus. Lugd.-Bat.* iv. 222 (*Rhombospora*).—Walp. *Rep.* ii. 504.

[8] *Linnæa*, v. 167; xix. 747.—DC. *Prodr.* iv. 618.—Endl. *Atakt.* 25, t. 24; *Gen.* n. 3136.—B. H. *Gen.* ii. 52, n. 68.—*Choristes* Benth. *Pl. Hartweg.* 63.

unequal. Corolla shortly funnel-shaped or subrotate; tube short or rather long; throat glabrous; lobes of limb 4, oftener acute, contorted,[1] finally open. Stamens 4, inserted in throat; filaments short; anthers dorsifixed at base, oblong or subsagittate, at apex obtuse or acute; cells introrse, free at base, rimose. Germen 2-celled; disk orbicular or subcupular; style slender or subulate, at apex stigmatose subentire, very shortly 2-lobed, or 2-linear-ramose. Ovules ∞, inserted on an oblong placenta peltately affixed to middle of septum. Fruit capsular, turbinate or obovoid, coriaceous or parchment-like, loculicidal at vertex; valves 2, fissous. Seeds ∞, inserted on thick separable placentas, globose or angular, granular or reticulate, albuminous.—Glabrous or pubescent, slender ramose shrubs; leaves petiolate, opposite, ovate or lanceolate, membranous veined; stipules interpetiolar, deciduous; flowers[2] axillary in loose umbelliform cymes, often few, oftener drooping or pendent; pedicels slender, ebracteolate.[3] (*Mexico.*[4])

160. **Sipanea** Aubl.[5]—Flowers 5-merous; receptacle ovoid or obconical. Calyx lobes 5, lanceolate (*Limnosipania*[6]), elongate-subulate or filiform (*Eusipanea*), persistent, sometimes glanduliferous within at base. Corolla funnel-shaped or hypocrateriform; tube slender rather long; throat variously pilose or glabrous, sometimes dilated; lobes of limb 5, ovate-oblong, contorted, finally open. Stamens inserted at throat; filaments short or elongate very slender; anthers oblong or linear dorsifixed, enclosed (*Eusipanea*) or exserted (*Limnosipania*). Germen 2-celled; disk orbicular or conical, sometimes very small; branches of slender style 2, linear stigmatose. Ovules ∞, inserted on placentas peltately affixed to septum. Fruit capsular, ovoid or subglobose, loculicidal. Seeds ∞, inserted on thick placentas, minute horizontal angular, reticulate or foveolate, albuminous.—Annual or perennial herbs, sometimes radicant aquatic or mud plants; leaves opposite (*Eusipanea*) or 3– ∞-nate, glabrous, setose or hispidulous, ovate, oblong or lanceolate; stipules linear-elongate, persistent or 0;[7] flowers[8]

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[1] Covering the right margin of the lobe (seen from the exterior).

[2] Small, white.

[3] A genus somewhat resembling *Chiococca* among the multiovulate *Rubiaceæ*.

[4] Spec. 7, 8. Hemsl. *Diagn. Pl. Nov. Mex.* 31.—Walp. *Ann.* i. 371.

[5] *Guian.* i. 147, t. 56.—Poir. *Dict.* vii. 199.—Lamk. *Ill.* t. 151.—Pers. *Syn.* i. 205.—Rich. *Rub.* 195.—DC. *Prodr.* iv. 414.—Endl. *Gen.* n. 3248.—B. H. *Gen.* ii. 52, n. 70.—*Virecta* L. f. *Suppl.* 17.—Gærtn. f. *Fruct.* iii. 31, t. 184.—J. *Mém. Mus.* vi. 385.

[6] Hook. f. *Icon.* t. 1050.—B. H. *Gen.* ii. 53, n. 71.

[7] ? If stipules then equal to leaves (as in the *Stellatæ*).

[8] Small, white or pink.

in terminal or axillary corymbiform cymes, bracteate and often bracteolate. (*Trop. America.*[1])

XI. CINCHONEÆ.

161. **Cinchona** L.—Flowers hermaphrodite regular; receptacle turbinate, enclosing adnate germen. Calyx short, oftener 5-dentate, persistent. Corolla hypocrateriform, oftener pubescent; tube straight, slightly dilated above, or terete, or obtusely 5-gonal; angles (opposite stamens) sometimes longitudinally divided below; throat glabrous or variously pilose; lobes of limb 5, valvate, finally patulous, fimbriate-pilose at margins. Stamens 5, inserted in corolla tube at dilatation (2-form); filaments short or rather long; anthers oblong dorsifixed to base, enclosed or partly exserted; cells 2, introrsely rimose. Germen inferior, 2-celled; disk epigynous orbicular pulvinate; branches of erect (short or rather long) style 2, enclosed or exserted, rather obtuse, stigmatose-papillose within. Ovules ∞, ascending, inserted on an axile placenta longitudinally adnate to septum. Fruit capsular ovoid, oblong-ovoid or subcylindrical, longitudinally 2-sulcate to septum, crowned with calyx, septicidally 2-valvate from base; pedicel also 2-fissous; valves at margin attenuate dehiscing inwards. Seeds ∞, ascending, peltate, inserted in hollows of angular-winged placentas; coat dilated to a broad membranous ovate or long-elliptical unequally lacerate reticulate wing; albumen fleshy; radicle of straight axile embryo terete inferior; cotyledons suborbicular or ovate.—Trees or shrubs (evergreen); bark bitter; ramules opposite terete or obtusely 4-gonal; leaves opposite, petiolate entire penninerved, sometimes foveolate beneath to axils of nerves, membranous or subcoriaceous; stipules interpetiolar, internally glanduliferous at base, deciduous; flowers in terminal brachiate compound cymiferous racemes. (*N. and S. And. America.*)—See p. 337.

162. **Cascarilla** Wedd.[2]—Flowers[3] of *Cinchona;* corolla lobes 5,

[1] Spec. about 12. H. B. K. *Nov. Gen. et Sp.* iii. 397.—Endl. *Atakt.* 7, t. 7.—Griseb. *Fl. Brit. W.-Ind.* 329.—Seem. *Her. Bot.* 136.—Walp. *Rep.* ii. 503; vi. 58.

[2] *Ann. Sc. Nat.* ser. 3, x. 10; *Hist. Nat. Quinq.* 77, t. 23–25.—Tri. *Nouv. Et. Quinq.* 24, 69.—B. H. *Gen.* ii. 32, n. 10.—*Ladenbergia* Kl. *Hayn. Arzn. Gew.* xiv. not. t. 15 (part).—*Buena* Wedd. *Journ. Linn. Soc.* xi. 185; *H. Bn. Dict. Bot.* i. 513.

[3] Small, white, odorous and sometimes, as in *Cinchona*, 2-morphous.

6, papillose within and at margins. Stamens inserted below middle of tube &c. of *Cinchona*. Fruit capsular, oblong, subcylindrical or clavate, septicidally 2-valvate from apex to base; seeds of *Cinchona*. —Trees or shrubs (evergreen); leaves opposite or 3, 4-nate and inflorescence of *Cinchona*.[1] (*Trop. and And. S. America.*[2])

163. **Remijia** DC.[3]—Flowers (nearly of *Cinchona*) 5-merous; calyx large. Corolla lobes acute or acuminate thick, valvate. Stamens enclosed. Disk orbicular or cupular. Capsule cylindrical, ovoid or subglobose, septicidal from apex; seeds winged &c. of *Cinchona*.— Small slender trees or shrubs; stem often simple; leaves opposite or 3-nate, petiolate; stipules intrapetiolar, sometimes large; flowers[4] in axillary broken and loose cymiferous racemes, generally long-pedunculate.[5] (*Trop. America.*[6])

164. **Ladenbergia** Kl.[7]—Flowers 5-merous; receptacle oblong or tubular. Calyx cupular, 5-dentate. Tube of hypocrateriform corolla elongate; throat glabrous; lobes of limb 5, obovate or obcordate, valvate induplicate or reduplicate, coriaceous, attenuate to margin and there undulate or lobed. Stamens 5, inserted in tube; anthers elongate dorsifixed. Germen 2-celled; disk orbicular; style subulate, at apex pointed obliquely stigmatose-2-lobed. Ovules ∞, inserted on a subcylindrical placenta adnate to septum. Fruit capsular subcylindrical or long clavate, sometimes contorted, septicidal from apex to base; valves 2, 2-fid at apex. Seeds ∞, imbricate, peltately inserted, produced on both sides to an elongate wing entire acute above, 2-furcate

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[1] Of which rather (?) a sect. as thought Brignoli (*Man. Piant. Nuov. Mém. Soc. Ital. Moden.* ser. 2, i. 52).

[2] Spec. about 25. Lamb. *Ill. Cinch.* t. 3 (*Cinchona*).—R. et Pav. *Fl. Per.* t. 196, 225.—H. B. *Pl. Æquin.* t. 39. Pohl, *Pl. Bras. Icon.* t. 8 (*Buena*).—Endl. *Iconogr.* t. 90 (*Cosmibuena*).—Karst. *Fl. Colomb.* t. 6, 7, 21, 41, 65 (*Cinchona*). —Walp. *Ann.* ii. 785.

[3] *Biblioth. Univ. Genève* (1829), ii. 185; *Prodr.* iv. 357.—Endl. *Gen.* n. 3273.—B. H. *Gen.* ii. 33, n. 11.—*Macrocnemum* Velloz. *Vandell. Fl. Lusit. et Bras.* 14 (not P. Br.).

[4] Small or moderate, sericeous, white or pink, odorous.

[5] A sect. of *Cinchona*, ex Brignoli. ? If a sect. of this genus is *Pimentelia* (Wedd. *Et. Quinq.* 94, t. 27 B.—B. H. *Gen.* ii. 33, n. 12;—Walp. *Ann.* ii. 789), which has an enlarged calyx, a corolla villose within, a short capsule and glomerate flowers on an axillary axis? Flowers not seen and the fruit, small, seems to resemble that of *Remijia*, septicidally 2-valvate from apex to base. *Stilpnophyllum* Hook. f. (*Icon.* t. 1147; *Gen.* ii. 33, n. 13) which is *Elæagia lineata* Spruce (herb. n. 4568), is also (?) a sect. of this genus; calyx short dentate; corolla valvate, with crowded ascending hairs; anthers dorsifixed, "exserted;" stylary lobes thick, papillose within at margin; leaves (of *Laurus*) acuminate coriaceous. Analogous also is *Chimarrhis*, whose corolla is not valvate.

[6] Spec. 12–15. A. S.-H. *Pl. Us. Bras.* t. 2 (*Cinchona*).—Karst. *Fl. Colomb.* t. 7, 35 (*Cinchona*).—Walp. *Rep.* ii. 509; *Ann.* ii. 781.

[7] *Hayn. Arzn. Gew.* xiv. not. t. 15 (part).—B. H. *Gen.* ii. 34, n. 16.—*Joosia* Karst. *Fl. Colomb.* 9, t. 5.

below, albuminous.—Puberulous trees;[1] leaves opposite, obovate-lanceolate acuminate, petiolate; stipules interpetiolar sericeous and linear-glandulose within; flowers[2] in compound cymiferous racemes, oftener secund, sessile, ebracteolate. (*Columbia, Peru.*[3])

165. **Macrocnemum** P. Br.[4]—Flowers[5] 5-merous; receptacle oblong. Calyx cupular; teeth 5, sometimes equal, partly foliaceous, persistent. Tube of funnel-shaped corolla rather long;[6] lobes of limb 5, valvate or reduplicate, pilose within at margin, finally open. Stamens inserted in tube; filaments unequal or subequal, barbate below or to middle; anthers short dorsifixed introrse, enclosed. Germen 2-celled; disk epigynous thick; branches of slender style stigmatose oblong or ellipsoid rather compressed. Ovules ∞, inserted on placenta adnate to septum. Fruit capsular, oblong, subclavate or subcylindrical, 2-sulcate, loculicidal. Seeds ∞, inserted on entire or fissous septum, imbricate, produced on both sides to a narrow entire wing, albuminous.—Trees or shrubs; leaves opposite, petiolate; stipules interpetiolar, deciduous; flowers[7] in terminal and axillary compound cymiferous racemes; pedicels bracteolate. (*Trop. America, Antilles.*[8])

166. **Hymenopogon** Wall.[9]—Flowers[10] 5-merous; receptacle long-obovoid. Calyx lobes long-subulate, sometimes subunequal. Tube of hypocrateriform corolla rather long; throat retrorsely villose; lobes of limb 5, short valvate, finally open, internally barbate at middle. Stamens 5, inserted under throat; filaments short; anthers narrow dorsifixed; cells rimose, free at base. Germen 2-celled; disk orbicular, ciliate; branches of slender style 2, long linear, stigmatose-papillose to middle. Ovules ∞, inserted on subpeltate placentas, fusiform. Fruit capsular coriaceous shortly clavate, crowned with

[1] Bark bitter.

[2] Small, "ash-grey."

[3] Spec. 1, 2. R. et Pav. *Fl. Per.* ii. t. 197 (*Cinchona*).—Walp. *Ann.* ii. 788.

[4] *Jam.* 165 (not of others).—L. *Amœn.* v. 413.—J. *Mém. Mus.* vi. 386 (part).—B. H. *Gen.* ii. 35, n. 17.—*Lasionema* Don, *Trans. Linn. Soc.* xvii. 141.—Endl. *Gen.* n. 3272.

[5] Somewhat of *Cinchona*.

[6] Before stamens sometimes longitudinally fissous.

[7] Moderate, white or pink.

[8] Spec. 7, 8. R. et Pav. *Fl. Per.* ii. t. 199 (*Cinchona*).—H. B. *Pl. Æquin.* t. 19 (*Cinchona*).—Wedd. *Et. Quinq.* 97, t. 27 (*Lasionema*); *Ann. Sc. Nat.* ser. 4, i. 75.—Griseb. *Fl. Brit. W.-Ind.* 322.—Walp. *Ann.* v. 119.—[Of this genus is (ex Tri.) *Cinchona dissitiflora* Mut. This genus is also referred to *Cinchona* by Brignoli, mem. cit. (*Mem. Soc. Ital. Moden.* ser. 2, i. 52).]

[9] *Roxb. Fl. Ind.* (ed. Car.) ii. 156; *Pl. As. Rar.* t. 22 (not P. Beauv.).—Rich. *Rub.* 202.—DC. *Prodr.* iv. 351.—Endl. *Gen.* n. 3276.—B. H. *Gen.* ii. 34, n. 15.—Hook. *Fl. Ind.* iii. 34.

[10] Somewhat of *Cinchona*.

calyx, 2-sulcate, septicidal and loculicidal at conical vertex; segments 4, obcuneate. Seeds ∞, imbricate, caudately alate on both sides; albumen fleshy; embryo minute.—An epiphyllous shrub; leaves opposite, oblong-lanceolate membranous, deciduous, petiolate; stipules interpetiolar, widely ovate-acute, glandulously ciliate to axils, persistent; flowers[1] in corymbiform cymes; some bracts of inflorescence changed to a petiolate leaflike lamina.[2] (*Mount. India.*[3])

167. **Hymenodictyon** Wall.[4]—Flowers 5, 6-merous; receptacle shortly ovoid. Calyx lobes deep, ovate or long subulate, deciduous. Tube of funnel-shaped or campanulate corolla terete narrow, glabrous within; lobes of limb 5, 6, valvate or reduplicate. Stamens inserted under throat; filaments short; anthers introrse, sometimes apiculate; connective often dilated. Germen 2-celled; disk orbicular; style slender, far exserted, at apex stigmatose ovoid or shortly fusiform, subentire or obscurely 2-lobed. Ovules ∞, inserted on placentas adnate to septum, ascending. Fruit capsular, subterete or oblong, oftener obtuse above, loculicidal; valves 2, finally free from placentas. Seeds ∞, ascending, dilated on both sides to a broadly ovate wing subentire or lacerate at margin, 2-lobed below; albumen fleshy; cotyledons of inverted embryo flat ovate or suborbicular; radicle inferior terete or clavate.—Trees or shrubs; bark bitter; ramules sometimes tortuous; leaves opposite, petiolate, glabrous or puberulous, deciduous; stipules interpetiolar glandulose-serrate, deciduous; flowers[5] in a terminal or axillary pendent sometimes spikelike compound cymiferous raceme; bracts 1, 2, leaflike, petiolate, reticulate, marcescent. (*Trop. Asia and Africa, Madagascar.*[6])

168. **Corynanthe** Welw.[7]—Flowers 5-merous; receptacle shortly ovoid. Calyx lobes lanceolate. Tube of funnel-shaped corolla[8] terete;

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[1] Rather large, white.

[2] White, reticulate.

[3] Spec. 2. Miq. *Fl. Ind.-Bat.* ii. 154.—Kurz, *For. Fl. Brit. Burm.* ii. 72.

[4] *Roxb. Fl. Ind.* (ed. Car.) ii. 148; *Tent. Fl. Nepal.* i. 31, t. 22; *Pl. As. Rar.* t. 188.—DC. *Prodr.* iv. 358.—Endl. *Gen.* n. 3270.—B. H. *Gen.* ii. 35, n. 19.—Hook. *Fl. Ind.* iii. 35.—*Kurria* Hochst. et Steud. *Flora* (1842), 233.

[5] Small, greenish.

[6] Spec. about 7. Don, *Trans. Linn. Soc.* xvii. 142.—Roxb. *Pl. Coromand.* t. 106 (*Cinchona*).—Wight, *Icon.* t. 1159 (*Cinchona*).—Miq. *Fl. Ind.-Bat.* ii. 153.—Bedd. *Fl. Sylv.* t. 219, cxxx.—Kurz, *For. Fl. Brit. Burm.* ii. 71.—Hiern, *Fl. Trop. Afr.* iii. 42.—Walp. *Rep.* ii. 943; vi. 63. (*H. madagascaricum* is a new species, certainly of this genus, but imperfectly known.)

[7] *Apontam.* (1859) 568, 590; *Trans. Linn. Soc.* xxvii. 37, t. 14.—B. H. *Gen.* ii. 36, n. 20.

[8] Nearly of *Pavetta*, of which this plant presents nearly all the characters except æstivation and ovules ∞.

throat dilated; lobes of limb ovate, induplicate-valvate; pubescent within, furnished externally under apex with a longer or shorter clavate appendage,[1] finally open. Stamens inserted in throat, sessile; anthers elongate exserted; cells introrse, free at base. Germen 2-celled; disk very thin; style slender, at apex stigmatose ovoid subclavate. Ovules ∞, inserted on an axile placenta, ascending, imbricate. Fruit capsular[2] oblong compressed, loculicidal. Seeds ∞, ascending, imbricate, dilated at margin to an oblong wing, entire ovate above, 2-lobed below; albumen . . . ?—A glabrous tree; bark bitter; leaves (persistent) opposite, petiolate, oblong-lanceolate; stipules elongate, caducous; flowers[3] in a 3-chotomous ramose compound cymiferous raceme; "pedicels ebracteolate." (*Angola.*[4])

169. **Danais** Commers.[5]—Flowers diœcious or polygamous; receptacle subglobose (in male flower smaller). Calyx lobes 4, 5, acute or subulate, persistent. Corolla hypocrateriform or funnel-shaped; lobes 4, 5, valvate; throat villose. Stamens 4, 5, 2-form; filaments inserted in throat, in male flower long slender exserted; in female short or 0; anthers dorsifixed (in female flower sterile) introrse, versatile, 2-rimose. Germen 2-celled; disk annular; style slender, in male flower shorter enclosed; branches 2, slender bare; in female flower far exserted; branches long, apex stigmatose terminating in a cone. Ovules ∞ (in male flower small sterile or 0), inserted on a peltate subglobose placenta. Fruit capsular (small) sub-2-dymous or globose, crowned with calyx, loculicidally 2-valved. Seeds ∞, small, imbricate, dilated at margin into a suborbicular wing; embryo small albuminous.—Shrubs generally climbing, glabrous or puberulous; leaves opposite or 3-nate, coriaceous, petiolate; stipules interpetiolar, 3-angular-acute; flowers[6] in axillary corymbiform cymes; bracts small or 0; bracteoles 0. (*East. trop. African is.*[7])

170. **Manettia** Mut.[8]—Flowers hermaphrodite or rarely polygamous; receptacle obconical or obovoid. Calyx lobes 4, or more rarely

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[1] Sometimes (as in *Nauclea*) deciduous, or 0.

[2] Small, coriaceous.

[3] Small, whitish.

[4] *C. paniculata* Welw. *loc. cit.*—Hiern, *Fl. Trop. Afr.* iii. 43.

[5] Ex Vent. *Tabl.* ii. 584.—Gærtn. f. *Fruct.* iii. 83, t. 195.—J. *Mém. Mus.* vi. 385.—Rich. *Rub.* 194.—DC. *Prodr.* vi. 361.—Endl. *Gen.* n. 3267.—J. de Cordem. *Adansonia*, x. 356.—B. H. *Gen.* ii. 36, n. 21.—Baker, *Fl. Maurit.* 137.

[6] Small, yellowish, odorous.

[7] Spec. 6, *I.* Lamk. *Ill.* t. 166, fig. 2 (*Pœderia*).—Baker, *Fl. Maur.* 137.—Balf. f. *Journ. Linn. Soc.* xvi. 13; *Bot. Rodrig.* 44.

[8] Mut. *L. Mantiss.* 558 (1767).—DC. *Prodr.* iv. 362.—Endl. *Gen.* n. 3266.—B. H. *Gen.* ii.

5, various in form, with teeth sometimes glanduliform (stipular?) interposed. Tube of long tubular-funnel-shaped or subcampanulate corolla obconical, sometimes very elongate, occasionally angular, glabrous or variously pilose within; lobes of limb 4, or more rarely 5, shortly 3-angular, valvate, finally recurved. Stamens inserted at throat; filaments short; anthers exserted introrse versatile, 2-rimose. Germen 2-celled; disk epigynous various; style slender, apex exserted longer or shorter clavate, entire or 2-lobed. Ovules ∞, inserted on an ascending placenta inserted at bottom of septum and there very shortly stipitate. Fruit capsular, septicidal from apex; valves 2, coriaceous or parchmentlike. Seeds ∞, inserted on ascending placentas, imbricate, dilated at margin to an unequally dentate wing; albumen hard; embryo straight.—Herbs, sometimes subshrubby, generally slender and twining, glabrous or variously clothed; leaves petiolate, oftener ovate-acuminate; stipules short acute; flowers[1] axillary solitary or variously cymose; peduncles or pedicels oftener slender, 2-bracteolate. (*Trop. and subtrop. America.*[2])

171. **Alseis** Schott.[3]—Flowers hermaphrodite or 1-sexual, 4–6-merous; receptacle obconical (in male flower smaller). Sepals oblong or subulate, sometimes remote, deciduous. Lobes of short tubular or narrow suburceolate corolla 4–6, small, 3-angular, valvate. Stamens 2-morphous (in female flower sterile), inserted at bottom of corolla; filaments villose, short or elongate; anthers introrse, versatile, sometimes far exserted; cells rimose, free at base. Germen 2-celled; disk epigynous thick; branches of slender pilose style 2, acute, papillose within, recurved. Ovules ∞, inserted on elongate placentas descending from top of cell, linear. Fruit capsular oblong, septicidal from apex. Seeds ∞, subpeltate fusiform; testa reticulate much produced on both sides; embryo rather long, albuminous.—Small glabrous or villose trees; leaves opposite, oblong lanceolate acuminate, petiolate; stipules interpetiolar; flowers[4] in axillary and

37, n. 24.—*Lygistum* P. Br. *Jam.* (1756) 142 (part), (a name having priority but applied to species of different genera, hence better relinquished).—*Nacibæa* Aubl. *Guian.* i. 95, t. 37.—*Bellardia* Schreb. *Gen.* 790 (1791).—*Conotrichia* Rich. *Rub.* 197, t. 14, fig. 1.—*Guagnebina* Vell. *Fl. Flum.* 45, Atl. t. 115–121.

[1] Rather large or small, white, red or azure, sometimes showy.

[2] Spec. 25–30. R. et Pav. *Fl. Per.* t. 89, 90.—H. B. K. *Nov. Gen. et Sp.* iii. 87.—Pœpp. et Endl. *Nov. Gen. et Sp.* iii. t. 228.—Griseb. *Fl. Brit. W.-Ind.* 329.—Hemsl. *Diagn. Pl. Nov. Mex.* 30.—Wawr. *Maxim. Reis. Bot.* t. 71.—Lindl. *Bot. Reg.* t. 693, 1866.—*Bot. Mag.* t. 3202, 5495.—Walp. *Rep.* ii. 507; vi. 62; *Ann.* ii. 779; v. 128.

[3] *Spreng. Syst. Cur. Post.* 404.—DC. *Prodr.* iv. 620.—Endl. *Atakt.* t. 33; *Gen.* n. 3268.—B. H. *Gen.* 38, n. 26.

[4] Small, white; the females much resembling those of the *Compositæ*.

terminal spikes, simple or ramose below; bracteoles 2, often sessile under germen. (*Trop. and cent. America.*[1])

172. **Cosmibuena** R. and Pav.[2]—Flowers 5, 6-merous; receptacle obconical or oblong. Calyx tubular or subcampanulate, oftener circumscissous; teeth or lobes 5, 6, sometimes unequal. Corolla funnel-shaped or hypocrateriform; tube very long; lobes of limb oblong 5, 6, contorted to right or left, more rarely imbricate. Stamens 5, 6, inserted under throat; filaments short; anthers oblong basifixed introrse enclosed. Germen 2-celled; disk conical or cupular; style clavate, 2-fid above; branches broad obtuse stigmatose. Ovules ∞, inserted on revolute 2-lobed placentas affixed to septum, interior, ascending, imbricate, produced on both sides to a rudimentary wing. Fruit oblong-cylindrical, septicidal; exocarp solute from endocarp; valves 2, patulous or more or less contorted. Seeds ∞, produced on both sides to a narrow wing; embryo albuminous.—Glabrous sometimes climbing shrubs;[3] leaves opposite rather fleshy, petiolate; stipules broad interpetiolar, deciduous; flowers[4] terminal cymose few (often 3) or solitary, more rarely compound cymose, bracteate and bracteolate. (*Trop. America.*[5])

173. **Ferdinandusa** Pohl.[6]—Flowers 4-merous; receptacle oftener obovoid. Calyx short cupular, 4-dentate, sometimes persistent. Tube of funnel-shaped or hypocrateriform corolla narrow, glabrous within, somewhat dilated to throat; lobes of limb 4, often unequal oblique, emarginate or 2-lobed, contorted, finally open. Stamens 4, inserted in tube; filaments unequally elongate; anthers oblong-elliptical introrse, recurved or revolute dorsifixed, 2-rimose. Germen 2-celled; disk rather thick; lobes of slender enclosed or exserted style oblong or subspathulate stigmatose. Ovules ∞, sometimes few, inserted on placentas adnate to septum, imbricate. Fruit capsular obovoid or oblong, sometimes narrow-cylindrical, septicidal; valves 2, concave or patulous. Seeds ∞, peltate, imbricate, dilated to an

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[1] Spec. 3, 4. Hemsl. *Diagn. Pl. Nov. Mex.* 30.

[2] R. et Pav. *Fl. Per.* iii. 3, t. 226.—Endl. *Gen.* n. 3275.—B. H. *Gen.* ii. 40, n. 33.—*Buena* Pohl, *Plant. Bras. Icon.* i. 8 (part).

[3] Often "epiphytal."

[4] Large, showy.

[5] Spec. 4, 5. R. et Pav. *Fl. Per.* t. 198 (*Cinchona*).—Kl. *Hayn. Arzn. Gew.* xiv. fig. 15 (*Cinchona*).—Benth. *Sulph. Bot.* t. 38 (*Buena*).—Walp. *Rep.* vi. 62 (part).

[6] *Pl. Bras. Icon.* ii. 8, t. 106-108.—Endl. *Gen.* n. 3277[1]; Suppl. i. 1393; ii. 53, n. 3277.—Wedd. *Ann. Sc. Nat.* ser. 4, i. 77.—B. H. *Gen.* ii. 40, n. 34.—*Ferdinandea* Pohl, *Flora* (1827), 153.—*Gomphosia* Wedd. *Et. Quinq.* 95, t. 26 B.—*Aspidanthera* Benth. *Hook. Journ. Bot.* iii. 217.—Endl. *Gen.* n. 3286[1] (Suppl. ii. 54).

entire or unequally lobed wing, albuminous.—Climbing trees or shrubs; leaves opposite or verticillate, petiolate; stipules interpetiolar various, deciduous; flowers[1] in brachiate compound cymiferous racemes, bracteate and bracteolate. (*Trop. America and Antilles.*[2])

174? **Ravnia** ŒRST.[3]—Flowers 5, 6-merous; receptacle obconical. Calyx lobes 5, 6, subulate, unequal. Lobes of slender curved tubular corolla 5, 6, obtuse, contorted (?), finally open; throat glabrous (?) "Stamens as many, inserted in throat, filaments short; anthers linear, apex exserted." Germen 2-celled; disk rather thick; branches of slender style 2, obtuse. Ovules ∞, ascending, inserted on a placenta adnate to septum. Fruit . . . ?—A climbing epiphytal shrub;[4] leaves opposite ovate-lanceolate rather fleshy, petiolate; stipules interpetiolar broad oblong; flowers at top of ramules cymose (3-nate) subsessile. (*Costa-Rica.*[5])

175. **Capirona** SPRUCE.[6]—Flowers 5, 6-merous; receptacle obconical. Calyx cupular or short-tubular, 5, 6-dentate, persistent; external tooth sometimes dilated to a petiolate foliaceous lamina. Corolla funnel-shaped-campanulate, sometimes slightly irregular; lobes of limb 5, 6, equal or unequal, obtuse contorted; throat glabrous. Stamens 5, 6, inserted in corolla tube; filaments connate in a membranous ring adnate to bottom of tube, remainder free; anthers basifixed elongate obtuse, enclosed, introrsely 2-rimose. Germen 2-celled;[7] disk epigynous cupular; style branches 2, linear, stigmatose within. Ovules ∞, inserted on thick placentas, imbricate. Fruit capsular obovoid, septicidal. Seeds ∞, peltate imbricate, dilated to an unequally dentate or lacerate wing, albuminous.—Trees;[8] leaves opposite, obovate-oblong, petiolate; stipules intrapetiolar oblong, sometimes concave within, connate at base; flowers[9] in terminal compound cymiferous racemes; the central sessile; the lateral pedicellate, bracteate and bracteolate. (*Peru, Columbia.*[10])

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[1] Small or rather large, white, greenish, pink, or purplish.

[2] Spec. about 12. WALP. *Ann.* v. 131.

[3] *Videnskab. Medd. Kjob.* (1852) 49.—B. H. *Gen.* ii. 40, n. 32.

[4] Habit of *Æschynanthus.*

[5] Spec. 1. *R. triflora* ŒRST.—WALP. *Ann.* v. 131.—*Bouvardia lævis* MART. et GAL.

[6] *Journ. Linn. Soc.* iii. 200.—B. H. *Gen.* ii. 39, n. 29.—? *Monadelphanthus* KARST. *Fl. Col.* 67, t. 33.—B. H. *Gen.* ii. 38, n. 28.

[7] Rarely 3-celled.

[8] Bark reddish or bright pink, sometimes partly deciduous.

[9] Large, purple, handsome.

[10] Spec. 2. SPRUCE, *loc. cit.*

176 ? **Platycarpum** H. B.[1]—Flowers irregular; receptacle depressed obconical, enclosing adnate germen. Calyx 4, 5-lobed or partite, deciduous, sometimes circumscissous at base. Corolla obliquely funnel-shaped or hypocrateriform, pubescent or sericeous within or on both sides; lobes 5, unequal, imbricate; tube sometimes furnished internally with a villose longitudinal middle line; throat more or less villose. Stamens 5, inserted at or under throat of corolla, unequal; filaments slender; anthers dorsifixed oblong introrse, versatile, 2-rimose. Germen inferior, 2-celled; disk epigynous annular (whitish), to 10-lobulate or (*Henriquezia*[2]) obtusely 5-lobed; branches of terete style 2, rather acute, erect. Ovules in cells 2 (*Euplatycarpum*) or 2-4 (*Henriquezia*), obliquely descending suborbicular, inserted on axile placenta. Fruit capsular sub-2-dymous, suborbicular or obcordate, marked at apex with a more or less deep hollow and also at the base (*Euplatycarpum*) or to middle (*Henriquezia*) with a rather prominent scar of the receptacular margin, marginally loculicidal; valves 2, with a thin septum in the middle. Seeds in cells 1–4, orbicular or reniform, broadly alate at margin; "cotyledons of exalbuminous embryo broad thin lateral, emarginate or 2-lobed at base; radicle minute turned towards hilum."—Trees sometimes lofty; leaves opposite or 3, 4-nate, oblong or lanceolate penninerved coriaceous, sometimes tomentose, petiolate; stipules interpetiolar large, caducous; flowers[3] in terminal compound cymiferous racemes; branches subverticillate. (*Venezuela, N. Brazil.*[4])

177 ? **Dolicholobium** A. Gray.[5]—Flowers 4, 5-merous; receptacle long-cylindrical. Calyx wide cupular or short funnel-shaped, truncate or 4, 5-lobed, ciliate, persistent. Tube of hypocrateriform corolla[6] long, glabrous within; lobes of limb obtuse, contorted. Stamens 5, 6, inserted in corolla tube, enclosed; filaments complanate; anthers basifixed elongate introrse. Germen 2-celled; disk orbicular; style dilated above; branches oblong petaloid more or less dilated, "stigmatose to costa." Ovules ∞, linear, inserted on elongate placentas adnate to septum. Fruit[7] "capsular cylindrical septicidal; seeds

[1] *Pl. Æquin.* ii. 81, t. 104.—H. B. K. *Nov. Gen. et Sp.* iii. 51; *Journ. Phys.* lxxxvii. 454.—Endl. *Gen.* n. 4129.—Bur. *Bignon.* 81.—B. H. *Gen.* ii. 44, n. 46.—H. Bn. *Bull. Soc. Linn. Par.* n. 28 (1879).

[2] Spruce, ex Benth. *Hook. Kew Journ.* vi. 338; *Trans. Linn. Soc.* xxii. 206, t. 52–54.—Bur. *Bignon.* 80, 100.—B. H. *Gen.* ii. 44, 1228, n. 45.—H. Bn. *loc. cit.*

[3] Large or rather so, pink (or white ?), odorous, showy.

[4] Spec. 4, 5. DC. *Prodr.* ix. 233.—Spreng. *Syst.* i. 622 (*Sickingia*).

[5] *Proc. Amer. Acad.* iv. 308.—B. H. *Gen.* ii. 41, n. 35.

[6] Nearly of *Gardenia.*

[7] Like that of *Siliquorandia*, but said to be capsular-dehiscent.

imbricate, long caudate at both ends, albuminous."—Shrubs; leaves opposite, petiolate, elongate membranous; stipules interpetiolar, wide subfoliaceous, deciduous; flowers terminal and axillary, shortly stipitate, 2, 3 cymose, or solitary. (*Feejee is.*[1])

178. **Coptosapelta** KORTH.[2]—Flowers 5-merous; receptacle short ovoid or obconical. Calyx short, 5-lobed, persistent. Corolla hypocrateriform coriaceous, sericeo-tomentose without; tube terete or obtusely 5-gonal; throat villose; lobes of limb elongate, closely contorted. Stamens 5, inserted in throat or mouth; filaments short; anthers subbasifixed elongate, sometimes contorted or flexuose, inserted to base; cells linear, free at base, introrsely rimose; connective linear, pilose at back. Germen 2-celled; disk small depressed; style erect long fusiform, sulcate and angular, exserted. Ovules ∞, ascending, inserted on a placenta adnate to septum. Fruit capsular short subglobose, crowned with calyx, loculicidal. Seeds ∞, imbricate peltate, dilated at margins to a membranous unequally dentate wing; radicle of albuminous embryo inferior.—Climbing sericeous or tomentose shrubs; leaves[3] opposite, petiolate; stipules interpetiolar, 3-angular, deciduous; flowers[4] in terminal compound racemose drooping cymes; pedicels short, 2-bracteolate.[5] (*Ind. Archip.*[6])

179. **Crossopteryx** FENZL.[7]—Flowers 4–6-merous; receptacle obovoid or subspherical. Calyx short, deciduous; lobes 4–6, obtuse. Corolla hypocrateriform; tube rather short; throat glabrous; lobes of limb 4–6, obtuse, contorted, open. Stamens as many, inserted in mouth; filaments short; anthers dorsifixed oblong or sublanceolate apiculate, introrse; cells 2, sometimes pointed below free. Germen 2-celled; disk annular; style slender exserted, at apex obovoid or shortly clavate, 2-lobed, stigmatose. Ovules ∞, inserted on a short subglobose or obovoid placenta peltately affixed to septum very shortly stipitate, more or less imbedded in hollows. Fruit capsular subglobose, areolate at apex, loculicidal; valves 2, very concave, internally septiferous at middle, 2-partible. Seeds ∞, oftener few, inserted on a thick rather prominent placenta, orbicular peltate, expanded at margin

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[1] Spec. 2, 3. SEEM. *Fl. Vit.* 121, t. 24.

[2] *Ned. Kruidk. Arch.* ii. 112.—HOOK. F. *Icon.* t. 1089; *Gen.* ii. 35, n. 18.—H. BN. *Bull. Soc. Linn. Par.* 181.—HOOK. *Fl. Ind.* iii. 34.

[3] Sometimes yellow.

[4] Moderate, "white."

[5] A genus very near *Crossopteryx*, at same time somewhat resembling *Corynanthe*.

[6] Spec. about 4. MIQ. *Fl. Ind.-Bat.* ii. 155.—WALP. *Ann.* ii. 779.

[7] *Nov. St. Mus. Vindob. Dec.* 45, n. 51.—ENDL. *Gen.* n. 3279.

to a dentate-ciliate wing, albuminous.—A tree or shrub, glabrous or pubescent; leaves opposite, oblong-obtuse, petiolate; stipules interpetiolar, 3-angular, somewhat persistent; flowers[1] in short terminal compound cymiferous racemes; bracteoles cetaceous.[2] (*Both trop. Americas.*[3])

180. **Mussaendopsis** H. Bn.[4]—Flowers 5-merous; receptacle turbinate. Calyx lobes 5, of which one sometimes foliaceous, petiolate; the others 3-angular, slightly connate at base. Corolla funnel-shaped; petals subfree, closely contorted, right margin covered. Stamens 5, inserted on receptacle under epigynous disk; filaments free; anthers short introrse, 2-rimose. Germen 2-celled; disk epigynous conical produced; lobes of short and at apex shortly clavate style 2, stigmatose, subequal. Ovules in cells ∞, inserted on axile placenta. Fruit short capsular, septicidal; seeds ∞, produced on both sides to a narrow wing; embryo rather large, sparsely albuminous.—A tree (?) very glabrous except at inflorescence; leaves opposite, elliptical-acuminate, subunequal at base, coriaceous, penninerved; veins crowded subtransverse; petiole rather long; stipules interpetiolar oblong membranous enclosing terminal bud of ramule; flowers[5] axillary in long-pedunculate opposite branched and cymiferous cymes.[6] (*Borneo.*[7])

181. **Hillia** Jacq.[8]—Flowers subregular; receptacle obovoid or tubular. Calyx entire or 2–5-lobed, oftener circumscissile at base; lobes foliaceous. Corolla hypocrateriform or sometimes funnel-shaped; tube long; throat dilated glabrous; lobes of limb 3–7, imbricate or sometimes contorted. Stamens as many, inserted under throat; filaments short or 0; anthers basifixed elongate exappendiculate, enclosed. Germen 2-celled; disk thick epigynous; style clavate to apex, 2-fid, obtuse enclosed. Ovules ∞, inserted on axile 2-lobed placentas. Fruit[9] capsular cylindrical or subclavate truncate, septici-

[1] Small, white or ochreous, odorous.

[2] A genus in flowers resembling *Coptosapelta* on the one hand, and on the other the pluriovulate species of *Pavetta*, but seeds winged.

[3] Spec. 1. *C. africana.*—*C. Kotschyana*, Fenzl. *loc. cit.*—Hiern, *Fl. Trop. Afr.* iii. 44.—*C. febrifuga* Benth. *Niger Fl.* 381.—*Rondeletia africana* Winterb. *Acc. S. Leone*, ii. 46 (1803).—*R. febrifuga* Afzel. ex G. Don, *Gen. Syst.* iii. (1832) 516.

[4] *Adansonia*, xii. 282.

[5] Small.

[6] A genus resembling *Crossopteryx* on one side, on the other *Calycophyllum*. It also resembles *Mussaenda* in its ∞-ovulate cells and foliaceous sepal, but corolla subdialypetalous and contorted.

[7] Spec. 1. *M. Beccariana* H. Bn. *loc. cit.*

[8] *St. Amer.* 96, t. 66.—L. *Gen.* n. 444.—Lamk. *Ill.* t. 257.—Gærtn. f. *Fruct.* iii. 97, t. 197.—J. *Mém. Mus.* vi. 388.—Rich. *Rub.* 207.—DC. *Prodr.* iv. 350.—Endl. *Gen.* n. 3277.—B. H. *Gen.* ii. 39, n. 31.—*Ferreiria* Vandell. *Fl. Lus. et Bras.* 21, t. 1, fig. 8; *Rœm. Scr.* 98, t. 6.—*Saldanha* Vell. *Fl. Flum.* 141, Atl. iii. t. 157, 158.

[9] Folliculiform.

dal; valves finally contorted; placentas marginal. Seeds ∞, ascending, imbricate, produced below to an acute caudex and above to a long ∞-setose pencil; albumen fleshy; cotyledons of straight embryo elliptical; radicle short inferior.—Radicant glabrous shrubs ("sometimes epiphytal"); leaves opposite rather fleshy, petiolate; stipules membranous interpetiolar, caducous; flowers [1] terminal solitary, sometimes sessile, bracteate and bracteolate.[2] (*Trop. America, Antilles.*[3])

182. **Calycophyllum** DC.[4]—Flowers 5-merous or more rarely 6–8-merous; receptacle oblong-cylindrical. Calyx gamophyllous entire, sometimes first nearly closed and then fissous (*Schizocalyx* [5]), oftener dentate or lobed; lobes sometimes induplicate (*Pallasia* [6]); one produced to a (coloured) foliaceous petiolate lamina, or all more rarely short (*Enkylista* [7]). Corolla funnel-shaped or hypocrateriform; tube straight or slightly curved; throat variously pilose; lobes of limb 5, or more rarely 6–8, imbricate. Stamens as many, inserted in throat or tube (*Pallasia, Schizocalyx*); anthers oblong introrse, generally exserted, versatile, sometimes unequal (*Pallasia*). Germen 2-celled; disk annular; lobes of often 2-form style 2, various in form, sometimes in bud exserted from corolla. Ovules ∞, inserted on placentas adnate to linear septum. Fruit capsular cylindrical, truncate at apex, septicidal. Seeds ∞, horizontal or oblique, often imbricate, either angular or compressed, scarcely or not at all winged [8] (*Warscewiczia, Pallasia*), or produced both ways to a more or less elongate wing (*Enkylista, Calycophyllum*); albumen fleshy; cotyledons of small embryo subovate; radicle terete.—Trees or shrubs; leaves opposite, ovate or oblong, petiolate; stipules interpetiolar, entire, ciliate or pubescent, deciduous or calyptrately secedent (*Schizocalyx*); flowers [9] in terminal compound-racemose cymes, corymbiform or sometimes (*Pallasia, Warscewiczia*) 1-parous and inserted on a long spikelike or racemiform axis; bracts sometimes foliaceous.[10] (*Trop. S. America and Antilles.*[11])

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[1] Large, white, odorous.

[2] A genus resembling *Posoqueria*, differing chiefly in equal corolla limb and penicillate seeds.

[3] Spec. 5. Sw. *Obs.* t. 5, fig. 1; *Fl. Ind. Occ.* t. 11.—Griseb. *Fl. Brit. W.-Ind.* 324.—? *Fl. Serr.* iii. t. 188.—*Bot. Mag.* t. 721.—Walp. *Rep.* ii. 510.

[4] *Prodr.* iv. 367.—Endl. *Gen.* n. 3263.—B. H. *Gen.* ii. 38, n. 27.

[5] Wedd. *Ann. Sc. Nat.* ser. 4, i. 73.—B. H. *Gen.* ii. 39, n. 30.

[6] Kl. *Mon. Akad. Wiss. Berl.* (1853) 498.—B. H. *Gen.* ii. 48, n. 57.

[7] Benth. *Hook. Kew Journ.* v. 230.

[8] Kl. *Mon. Akad. Wiss. Berl.* (1853) 496.—B. H. *Gen.* ii. 48, n. 56.

[9] Small, white (or pink ?).

[10] A genus analogous to *Pinckneya* among the genera with imbricate corolla.

[11] Spec. about 8. Vahl, *Symb.* ii. t. 29, 30 (*Macrocnemum*).—Schomb. *Hook. Lond. Journ.* (1844) t. 23, 24.—Œrst. *Centr.-Amer.* t. 12.—

183. **Molopanthera** Turcz.[1]—Flowers (nearly of *Enkylista*) 4, 5-merous; receptacle subglobose. Teeth of deciduous calyx 4, 5. Corolla in clavate bud curved upwards; tube short, glabrous within; lobes of limb 4, 5, somewhat unequal, closely imbricate, finally patulous, recurved. Stamens 4, 5; filaments inserted at base of corolla; anthers introrse, dorsifixed to base, apiculate and pointed at base, 2-rimose. Germen inferior, 2-celled; disk small epigynous; lobes of short rather thick style 2, stigmatose, obtuse. Ovules ∞ (few), inserted on a subglobose transversely or ascending stipitate placenta. Fruit capsular, globosely 2-dymous, coriaceous, loculicidal. Seeds few peltate orbicular, imbricate, produced at margin to an unequally dentate wing.—Trees or shrubs, glabrous or pubescent; leaves opposite, ovate or oblong, petiolate; stipules interpetiolar small, caducous; flowers [2] in terminal and axillary brachiate-ramose cymiferous racemes, bracteate and bracteolate. (*Brazil.*[3])

184. **Thysanospermum** Champ.[4]—Flowers (nearly of *Coptosapelta*) 4, 5-merous; receptacle turbinate. Sepals free truncate, imbricate, persistent. Tube of sericeous hypocrateriform corolla glabrous within; lobes of limb 4, 5, short obtuse, villose within, subsinuate at margins, imbricate or contorted. Stamens same in number; filaments short pilose inserted between lobes; anthers elongate introrse, sometimes contorted apiculate exserted versatile. Germen 2-celled; disk conical truncate; style slender, fusiform above sulcate papillose exserted. Ovules ∞, or few, inserted on a subglobose peltate placenta. Fruit capsular, 2-dymous, loculicidal. Seeds inserted on subglobose foveolate placentas peltate orbicular compressed, produced at margin in a lacero-dentate wing; embryo . . . ?—A slender creeping shrub;[5] branches adpressed pilose; leaves oppositely 2-stichous, ovate, shortly petiolate; stipules interpetiolar subulate, persistent; flowers [6] axillary solitary; peduncle 2-bracteate. (*Hongkong.*[7])

185. **Exostema** Pers.[8]—Flowers generally 5-merous; receptacle

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Griseb. *Fl. Brit. W.-Ind.* 325 (*Warscewiczia*).—Wedd. *loc. cit.* 72 (*Warscewiczia*).—Walp. *Ann.* v. 122 (*Warscewiczia, Pallasia*), 124 (*Enkylista*).

[1] *Bull. Mosc.* (1848) i. 580.—B. H. *Gen.* ii. 41, n. 37.

[2] Small, white (?).

[3] Spec. 2. Walp. *Ann.* ii. 799.

[4] *Hook. Kew Journ.* iv. 168.—B. H. *Gen.* 43, n. 43.

[5] Habit of some *Loniceræ*.

[6] Small, white.

[7] Spec. 1. *T. diffusum* Champ.—Benth. *Fl. Hongkong.* 146.

[8] *Synops.* i. (1805) 196 (*Cinchonæ* sect.).—L.-C. Rich. *H. B. Pl. Æquin.* i. 131, t. 38.—*Exostemma* DC. *Diss.* (1806) ex *Prodr.* iv. 358 (1830).—A. Rich. *Rub.* 200, t. 14, n. 2.—Spach. *Suit. à Buffon*, viii. 394.—Endl. *Gen.* n. 3269

ovoid, shortly clavate or turbinate. Calyx oftener short, dentate or variously lobed, persistent or deciduous. Corolla hypocrateriform; tube sometimes very elongate, slender, straight or slightly curved; throat glabrous or variously pilose; lobes of limb 5, or more rarely 4, imbricate. Stamens as many, inserted at bottom of tube;[1] filaments free or 1-adelphous at base, slender, glabrous or pubescent; anthers elongate introrse, dorsifixed to base, oftener exserted; cells rimose, free below. Germen 2-celled; disk epigynous annular or depressed conical; style slender, attenuate at base and there sometimes articulate, stigmatose apex exserted capitate or short-conical, sometimes obtuse or shortly 2-lobed. Ovules ∞, inserted on a placenta adnate to septum, ascending or radiating or more rarely subhorizontal superposed. Fruit capsular oblong, ovoid or subclavate, septicidal; valves 2, entire or 2-lobed. Seeds ∞, imbricate, variously produced to a wing; albumen fleshy; cotyledons of small embryo subovate.—Trees or shrubs, sometimes spinescent; bark bitter; leaves opposite, sometimes small, petiolate or subsessile; stipules inter- or intrapetiolar, simple or 2-lobed, deciduous; flowers[2] terminal or axillary, in corymbiform cymes or in ramose racemes, sometimes few or solitary, bracteolate or ebracteolate.[3] (*Cent. America, Antilles, Tonga and Feejee is.*[4])

186. **Luculia** Sweet.[5]—Flowers 5-merous; receptacle turbinate. Calyx lobes unequal oblong subfoliaceous, imbricate, deciduous. Corolla hypocrateriform; tube long, scarcely enlarged to throat; lobes of limb imbricate, sometimes callous at base, open. Stamens inserted in tube; filaments short, sometimes connate with tube below; anthers dorsifixed, introrse, enclosed or exserted only at apex. Germen 2-celled; disk annular; branches of slender subclavate style 2, enclosed, narrow, stigmatose within. Ovules ∞, inserted on 2-lamellate revolute

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(part).—B. H. *Gen.* ii. 42, n. 39.—*Badusa* A. Gray, *Proc. Amer. Acad.* iv. 308.—B. H. *Gen.* ii. 42, n. 10.—*Solenandra* Hook. f. *Icon.* t. 1150; *Gen.* ii. 43, n. 41.—H. Bn. *Bull. Soc. Linn. Par.* 199.

[1] Sometimes they appear inserted on the receptacle itself and nearly free from the corolla.

[2] Large, moderate or small, white, yellowish (?) or pink.

[3] A genus Brignoli (*loc. cit.*) also reduces to a sect. of *Cinchona*.

[4] Spec. about 23. Jacq. *Amer.* t. 179, fig. 65 (*Cinchona*).—Lamb. *Cinch.* t. 4-9 (*Cinchona*).—Forst. *Act. Nov. Upsal.* iii. 176 (*Cinchona*).—L. f. *Suppl.* 144 (*Cinchona*).—Gærtn. *Fruct.* i. t. 33 (*Cinchona*).—A. S.-H. *Pl. Us. Bras.* t. 3.—Pœpp. et Endl. *Nov. Gen. et Sp.* iii. t. 237.—Rœm. et Sch. *Syst.* v. 18.—Vahl, *Symb.* ii. 27; *Act. Hafn.* i. 20, t. 4.—Linds. *Trans. Soc. Roy. Edin.* (1794) 214, t. 5.—A. Rich. *Fl. Cub.* t. 48.—Griseb. *Fl. Brit. W.-Ind.* 323; *Cat. Pl. Cub.* 125.—Hemsl. *Diagn. Pl. Nov. Mex.* 32.—Chap. *Fl. S. Un. St.* 179.—*Bot. Mag.* t. 4186.—Walp. *Rep.* ii. 508; vi. 63; *Ann.* v. 128.

[5] *Brit. Fl. Gard.* t. 145.—DC. *Prodr.* iv. 357.—Don, *Trans. Linn. Soc.* xvii. 143.—Endl. *Gen.* n. 3271; Suppl. iii. 73.—B. H. *Gen.* ii. 43, n. 42.—Hook. *Fl. Ind.* iii. 36.

lobes of placentas. Fruit capsular, obovoid, septicidal; valves 2, 2-partible. Seeds ∞, small, imbricate, produced on both sides to a narrow wing lacerate at apex; embryo albuminous.—Shrubs; leaves opposite, acuminate, petiolate; stipules interpetiolar, deciduous; flowers[1] in compound terminal corymbiform cymes; bracteoles deciduous.[2] (*Temp. mount. India.*[3])

187. **Chimarrhis** Jacq.[4]—Flowers hermaphrodite or polygamous, oftener 5-merous; receptacle obconical or subcampanulate. Calyx short, often cupular, subentire or dentate, sometimes imbricate. Corolla cylindro-campanulate or funnel-shaped, sometimes suburceolate; lobes[5] short imbricate or subvalvate, sometimes very short, 3-angular or suborbicular, suddenly narrowed at base. Stamens 2-morphous, inserted near base of corolla or higher, sometimes between lobes; filaments short or elongate exserted, often dilated at base, barbate or villose; anthers oblong, versatile; cells introrse, at base oftener free, rimose, enclosed or exserted. Germen 2-celled; disk orbicular or hemispherical; style[6] short or elongate sulcate; branches 2, oftener obtuse recurved, sometimes marginate below apex. Ovules ∞, inserted on axile placenta,[7] either oblique or subhorizontal superposed. Fruit capsular, septicidal; valves sometimes 2-partite; exocarp seceding from endocarp. Seeds ∞, oftener short, at margin shortly or more or less broadly alate; wing unequally dentate.—Glabrous or pubescent trees; leaves opposite, often large, sometimes cordate at base or long unequally attenuate; stipules interpetiolar various, deciduous or caducous; flowers[8] in axillary or oftener terminal compound-ramose and cymiferous racemes, bracteate and bracteolate. (*Trop. America and Antilles.*[9])

188. **Nauclea** L.[10]—Flowers spuriously capitate, 5-merous; receptacle free obconical. Calyx 5-partite or 5-lobed; lobes various,

[1] White or pink, showy, sweet-scented.

[2] A sect. of *Cinchona*, ex Brignoli, *loc. cit.*

[3] Spec. 2. Wall. *Tent. Fl. Nepal.* t. 21 (*Cinchona*).—Kurz, *For. Fl. Brit. Burm.* ii. 71.—*Bot. Mag.* t. 3046, 4132.

[4] *St. Amer.* 61.—J. *Gen.* 204; *Mém. Mus.* vi. 381.—DC. *Prodr.* iv. 403.—Endl. *Gen.* n. 3260.—B. H. *Gen.* ii. 45, n. 48.—*Sickingia* W. *Ges. Naturf. Fr. Berl. N. Schr.* iii. 445; *Schrad. Journ. Bot.* (1800) ii. 291.—Rich. *Rub.* 200.—DC. *Prodr.* iv. 621.—Endl. *Gen.* 566.—B. H. *Gen.* ii. 34, n. 14.—H. Bn. *Adansonia*, xii. 302.—*Sprucea* Benth. *Hook. Kew Journ.* v. 230.—B. H. *Gen.* ii. 43, n. 44.

[5] Sometimes 4 or 6, separable sometimes almost to the base of the (subdialypetalous) corolla.

[6] Sometimes exserted before anthesis and compressed between the short lobes of the corolla.

[7] Sometimes apparently sterile.

[8] Small, white, sometimes deep reddish on drying, odorous.

[9] Spec. about 12. Griseb. *Fl. Brit. W.-Ind.* 323.—Walp. *Ann.* v. 120 (*Sprucea*).

[10] *Gen.* n. 223.—J. *Gen.* 209.—Rich. *Rub.* 208.—DC. *Prodr.* iv. 343.—Endl. *Gen.* n. 3280.—B. H. *Gen.* ii. 31, n. 6.—H. Bn. *Adansonia*, xii. 311.—Hook. *Fl. Ind.* iii. 26.

sometimes clavate, persistent or deciduous. Corolla funnel-shaped-tubular; tube slender; throat glabrous or pilose; lobes of limb 5, furnished at back sometimes to apex with a bacillar appendage,[1] valvate (*Mitragyne*,[2] *Adina*[3]), subvalvate (*Micradina*[4]) or highly imbricate (*Eunauclea*, *Adinium*[5]). Stamens inserted at or below throat; filaments long, short or 0; anthers oblong, dorsifixed, introrse, oftener muticous, exserted. Germen 2-celled; disk small annular or cupular, sometimes subnil; style slender exserted, at stigmatose apex fusiform, clavate, capitate or mitre-shaped. Ovules in cells ∞, or few (*Adinium*), very few or subsolitary (*Micradina*), inserted on a placenta adnate to septum or oftener affixed under apex of cell and descending; micropyle generally superior. Compound fruit congested in a spurious globose capitule, free, capsular, 2-coccous; cocci separable, generally 2-partible. Seeds ∞, few or 1, imbricate, winged (oftener narrow-) on both sides, albuminous.—Trees or shrubs; wood often hard; leaves opposite, often coriaceous glabrous, petiolate; stipules inter- or intra-petiolar, oftener large,[6] deciduous; flowers in compound contracted globose-capituliform terminal and axillary sometimes racemose glomerules; bracts and bracteoles between flowers paleaceous (*Adina*, *Mitragyne*), in fruit hardened persistent, sometimes small or 0. (*Trop. and subtrop. Africa, Asia and Oceania.*[7])

189. **Cephalanthus** L.[8]—Flowers spuriously capitate (nearly of *Nauclea*), 4, 5-merous;[9] receptacle obconical or obpyramidal. Calyx gamophyllous short-tubular, lobes or teeth sometimes unequal 4, 5, slightly imbricate; small (stipular) glandules often interposed. Corolla funnel-shaped; tube rather long; throat glabrous or pilose;

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[1] As in *Corynanthe* (otherwise not unlike in flowers).

[2] Korth. *Obs. Naucl. Ind.* 19 (not R. Br.).—H. Bn. *Adansonia*, xii. 313.—*Stephegyne* Korth. *Verh. Nat. Gesch.* (1839–42) 160, t. 35.—B. H. *Gen.* ii. 31, n. 5.

[3] Salisb. *Par. Lond.* t. 115.—DC. *Prodr.* iv. 349.—B. H. *Gen.* ii. 30, n. 4.—Hook. *Fl. Ind.* iii. 24.

[4] H. Bn. *Adansonia*, xii. 314.

[5] H. Bn. *Adansonia*, xii. 284, 314.

[6] Sometimes membranous and enclosing the top of a ramule.

[7] Spec. about 50. Gærtn. *Fruct.* i. 151, t. 30.—Roxb. *Pl. Corom.* i. t. 52–54.—Korth. *Gesch. Verh. Nat.* 150, 156.—Benth. *Niger Fl.* t. 37.—Hook. *Icon.* t. 787 (*Platanocarpum*).—Miq. *Fl. Ind.-Bat.* ii. 136, 342; Suppl. 214, 538; *Ann. Mus. Lugd.-Bat.* iv. 181 (*Stephegyne*), 183 (*Adina*).—Benth. *Fl. Hongk.* 146 (*Adina*).—Bedd. *Ic. Pl. Ind. Or.* i. t. 18 (*Stephegyne*), 19, 235; *Fl. Sylv.* t. 29, 33–35, cxxvi. (*Adina*), cxxviii. (*Stephegyne*).—Thw. *Enum. Pl. Zeyl.* 137.—Kurz, *For. Fl. Brit. Burm.* ii. 64.—Hiern, *Fl. Trop. Afr.* iii. 39 (*Adina*), 40 (*Mitragyne*).—*Bot. Reg.* t. 895.—*Bot. Mag.* t. 2613.—Walp. *Rep.* ii. 511, 513 (*Stephegyne*); vi. 70 (*Stephegyne*); *Ann.* ii. 791 (*Stephegyne*).

[8] *Gen.* n. 113.—J. *Gen.* 209; *Mém. Mus.* vi. 402.—Gærtn. *Fruct.* ii. 41, t. 86.—Lamk *Ill.* t. 59.—Rich. *Rub.* 75.—DC. *Prodr.* iv. 538 (part).—Spach, *Suit. à Buffon*, viii. 462.—Endl. *Gen.* n. 3138.—B. H. *Gen.* ii. 30, n. 3.—Hook. *Fl. Ind.* iii. 23.—*Platanocephalus* Vaill. *Act. Acad. Par.* (1722) 191.

[9] Rarely 6-merous.

lobes of limb 4, 5, imbricate; subglobose (black) glandules sometimes inserted in hollows of lobes. Stamens and germen of *Nauclea;* top of style elongate exserted stigmatose clavellate or capitate. Ovules in cells solitary, descending; micropyle introrsely superior. Fruit obconical or obpyramidal, coriaceous, crowned with calyx; cocci 2, seminiferous (sometimes 2 seedless interposed). Seeds oblong sometimes subangular; funicle short increased to a thick fleshy aril; coat sometimes short-winged above; albumen hard, sometimes thin; cotyledons of inverted embryo flat; radicle conical superior.—Small trees or shrubs; leaves opposite or 3, 4-nate, petiolate; stipules intra- or nearly interpetiolar simple, at apex and sometimes within dark-glandulose; flowers [1] in compound capituliform terminal and axillary pedunculate glomerules, minutely bracteolate.[2] (*Warm and temp. N. and S. America, temp. S. and E. Asia, "subtrop. south. Africa."* [3])

190. **Ourouparia** Aubl.[4]—Flowers spuriously capitate (nearly of *Nauclea*); receptacle tubular or fusiform. Calyx tubular, funnel-shaped or campanulate. Corolla tubular-funnel-shaped; throat glabrous; lobes of limb 5, imbricate. Stamens 5, inserted in throat; filaments short or 0; anthers elongate dorsifixed introrse; cells rimose, at base free pointed or produced to a seta. Germen &c. of *Nauclea;* top of style stigmatose capitate. Ovules ∞, inserted on a placenta affixed to septum or descending, ascending. Fruit capsular elongate, septicidal; valves oftener 2-partible. Seeds ∞, ascending, imbricate, produced on both sides to a narrow wing; wing on both sides entire, or one oftener 2-fid; embryo albuminous.—Climbing shrubs, glabrous or tomentose or hirsute; leaves opposite, petiolate or subsessile; stipules interpetiolar various; flowers [5] in compound contracted capituliform sometimes 1-parous cymes; pedicels very short or 0, or more rarely rather long; inflorescences in a raceme or oftener axillary solitary; peduncle most frequently sterile changed to a hard hooked tendril. (*Trop. Asia and Africa, Madagascar, trop. Oceania, south-east. America.*[6])

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[1] Small, white or yellow.

[2] Affinity with the *Guettardeæ* well indicated (Hook. f.). But a genus, by the intervention of *Micradina*, very closely connected with *Nauclea.*

[3] Spec. 5, 6. Duham. *Arbr.* t. 54.—H. B. *Pl. Æquin.* t. 98.—Bart. *Fl. Med.* t. 91.—A. Gray, *Man.* (ed. 2) 172.—Chapm. *Fl. S. Unit. St.* 176.—Miq. *Fl. Ind.-Bat.* ii. 152, 344.—Walp. *Rep* ii. 469; vi. 700.

[4] *Guian.* i. 177, t. 68.—H. Bn. *Adansonia*, xii. 315.—*Uncaria* Schreb. *Gen.* i. 125.—DC. *Prodr.* iv. 347.—B. H. *Gen.* ii. 31, n. 7.—Hook. *Fl. Ind.* iii. 28.—*Agylophora* Neck. *Elem.* i. 145.—*Poduncaria* H. Bn. *Bull. Soc. Linn. Par.* n. 29.

[5] Small, whitish or yellowish, sometimes purplish, often villose or sericeous.

[6] Spec. about 30. Wall. *Roxb. Fl. Ind.* ii. 125; *Pl. As. Rar.* t. 170.—Deless. *Ic. Sel.* iii. t. 81.—Miq. *Fl. Ind.-Bat.* ii. 141, 343; Suppl. 214, 538;

191. **Paracephælis** H. Bn.[1] — Flowers spuriously capitate, 5-merous (nearly of *Nauclea*); receptacle obovoid. Calyx persistent; lobes 5, ovate-acute. Corolla[2] and stamens . . . ? Germen 2-celled; disk epigynous orbicular; style . . . ? Ovules in cells few (6–8), inserted on a peltate placenta orbicularly affixed to septum, suborbicular compressed. Fruit . . . ?—A shrub densely tomentose in every part; branches 2-furcate, at apex bearing 2 opposite, petiolate leaves, cordate at base, obtuse at apex, thick soft, scabrous above, velutinous beneath; nerves rather prominent reticulate; stipules acute; glomerules gathered in a capituliform globe; flowers shortly pedicellate, free, 1-bracteate, 2-bracteolate. (*Madagascar.*[3])

192. **Sarcocephalus** Afzel.[4]—Flowers spuriously capitate (nearly of *Nauclea*); germens inferior adnate in hollows of receptacle and continuous with it. Calyces free, truncate or dentate; teeth appendiculate or muticous (*Platanocarpus*[5]). Corolla (of *Nauclea*) imbricate or more rarely valvate. Stamens of *Nauclea;* anthers oftener subsessile. Germen inferior, 2-celled or 4-cellulate above (*Anthocephalus*[6]); ovules in cells 1–∞, inserted on an entire or 2-lobed placenta depending from top of septum, descending. Fruit compound (syncarpous), consisting of receptacle confluent with exocarps; flesh sometimes scanty (*Cephalidium*,[7] *Breonia*[8]); putamens 1–∞-spermous, membranous, rather hard or crustaceous. Seeds crustaceous, granular or cancellate, minutely arillate, albuminous.—Trees or shrubs, rarely climbing; leaves opposite, subcoriaceous or coriaceous, sometimes large, petiolate; stipules interpetiolar various, deciduous or caducous; inflorescences[9] bracteate or ebracteate, axillary or terminal; peduncles oftener long rigid, sometimes bearing above (*Breonia*) a spathiform involucre surrounding the inflorescence and rising above it in long-horned apex. (*Trop. Asia, Oceania and Africa, Madagascar.*[10])

Ann. Mus. Lugd.-Bat. iv. 184.—Korth. *Verh. Nat. Gesch.* 162, t. 33, 34.—Thw. *Enum. Pl. Zeyl.* 138.—Kurz, *For. Fl. Brit. Burm.* ii. 68.—Benth. *Niger Fl.* t. 42.—Hook. *Icon.* t. 781.—Hiern, *Fl. Trop. Afr.* iii. 41.—Karst. *Fl. Col.* 153, t. 180 (*Nauclea*).—Walp. *Rep.* ii. 512, 943; *Ann.* i. 378.

[1] *Adansonia*, xii. 315.

[2] The younger valvate?; apex of lobes incurved.

[3] Spec. 1. *P. tiliacea* H. Bn. *loc. cit.*

[4] Ex Sab. *Trans. Hort. Soc.* v. 422, t. 18.—Lindl. *op. cit.* vii. 56.—Rich. *Rub.* 211.—DC. *Prodr.* iv. 367.—Endl. *Gen.* n. 3281.—B. H. *Gen.* ii. 29, n. 1.—Hook. *Fl. Ind.* iii. 22.—*Cephalina* Thönn. et Schum. *Beskr.* 105 (incl.: *Anthocephalus* Rich. *Breonia* Rich. *Cephalidium* Rich. *Platanocarpus* Korth.).

[5] Korth. *Verh. Nat. Gesch.* 152, t. 32.

[6] Rich. *Rub.* 157 (part).—Endl. *Gen.* n. 3236.—B. H. *Gen.* ii. 29, n. 2.—Hook. *Fl. Ind.* iii. 23.

[7] Rich. *Rub.* 210.—Endl. *Gen.* 1393.

[8] Rich. *Rub.* 210.—DC. *Prodr.* iv. 620.—Endl. *Gen.* n. 3285.—B. H. *Gen.* ii. 32, n. 8.—H. Bn. *Adansonia*, xii. 311.

[9] Rightly compound-glomerulate; flowers white, yellow, golden or red.

[10] Spec. about 15. Roxb. *Fl. Ind.* ii. 121

XII. DIERVILLEÆ.

193. **Diervilla** T.—Flowers hermaphrodite, subregular; receptacle long flask-shaped and contracted above to a long neck. Calyx lobes 5, connate at base, elongate, persistent or tardily deciduous. Corolla funnel-shaped or subcampanulate; tube subequal, at base sometimes increased internally by anterior glandules of disk; lobes of limb 5, oblong or lanceolate, erect or recurved, subequal or dissimilar, imbricate, deciduous or persistent. Stamens 5, alternate, inserted in corolla tube; filaments subequal; anthers exserted or enclosed, dorsifixed, introrse, 2-rimose. Germen 2-celled; style long slender, at apex stigmatose capitate or subdiscoid. Ovules in cells (complete or incomplete) ∞, descending from lateral teeth of placenta; micropyle superior. Fruit sometimes crowned with calyx, capsular, elongate, coriaceous or woody, septicidal; valves 2, dehiscing inwards. Seeds ∞, descending, imbricate, compressed or narrow or broad membranous-winged at margins; testa oftener cancellate; albumen fleshy; cotyledons of rather large embryo subelliptical rather thick; radicle terete superior.—Glabrous or more rarely pubescent shrubs, erect or subsarmentose; buds scaly; leaves opposite, sessile or petiolate, exstipulate, entire or serrulate, membranous; flowers in terminal and axillary cymes; cymules often 3-chotomous, bracteolate. (*Temp. east. Asia, north-east. America.*)—See p. 352.

XIII. LONICEREÆ.

194. **Leycesteria** Wall.—Flowers hermaphrodite regular; receptacle ovoid-flask-shaped, capitate-glandulose without, enclosing adnate germen. Calyx inserted at top of neck cupular; lobes 5, very unequal pointed. Corolla regular funnel-shaped; tube obconical, equally ventricose at base, and there having 5 sessile glandules between the

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Nauclea).—DC. *Prodr.* iv. 344, n. 8 (*Nauclea*).—Sm. *Rees Cyclop.* xxiii. n. 5 (*Nauclea*).—Winterb. *Acc. S.-Leone*, ii. 45 (*Nauclea*).—Korth. *Verh. Nat. Gesch.* 153 (*Anthocephalus*).—Hook. f. *Niger Fl.* 379.—Miq. *Fl. Ind.-Bat.* ii. 132, 135 (*Anthocephalus*); Suppl. 213; 214 (*Anthocephalus*), 538; *Ann. Mus. Lugd.-Bat.* iv. 179, 180 (*Anthocephalus*).—Benth. *Fl. Austral.* iii. 402.—Bedd. *Fl. Sylv.* t. 35 (*Nauclea*), cxxvi. (*Anthocephalus*).—Kurz, *For. Fl. Brit. Burm.* ii. 62.—T. Thoms. *Speke Journ. App.* (1863) 636 (ex Hiern).—Schweinf. *Rel. Kotsch.* 49, t. 33.—Hiern, *Fl. Trop. Afr.* iii. 38.

stamens; lobes of limb 5, imbricate. Stamens 5, alternipetalous; filaments inserted under throat, subequal; anthers oblong dorsifixed introrse, 2-rimose. Germen inferior, 2-celled; cells alternating with calycinal lobes; style slender exserted, at apex stigmatose depressed-capitate entire or slightly lobed. Ovules ∞, inserted on axile placentas, 2-seriate. Fruit fleshy ovoid, crowned with calyx. Seeds ∞, small compressed, albuminous; embryo minute.—A shrub branched from base; branches fistular between nodes; leaves opposite, ovate-acuminate, sometimes cordate, entire or dentate (sometimes pinnatilobed on younger branches) membranous; petioles connate at base; flowers in terminal spikes axillary to uppermost leaves, drooping; bracts large (coloured) bearing solitary or few or glomerulate cymose flowers in axil. (*Mount. India.*)—See p. 354.

195 ? **Pentapyxis** Hook. f.[1]—Flowers nearly of *Leycesteria;* receptacle ovoid. Calyx cup-shaped, 5-lobed, finally deciduous. Corolla subcampanulate; tube equal or occasionally slightly gibbous at base; lobes of limb 5, equal, contorted or imbricate. Stamens 5, inserted in throat; anthers oblong introrse slightly exserted. Germen inferior, 5-celled; style slender, thickened to base, at apex stigmatose capitately 5-lobed. Ovules in cells (complete or incomplete) ∞, inserted on rather prominent placenta. Fruit baccate; seeds ∞, angular smooth, albuminous; embryo minute.—Shrubs; leaves opposite, petiolate, ovate-lanceolate serrate-dentate; stipules large orbicular foliaceous, recurved; flowers[2] in axillary pedunculate bracteate (spurous ?) capitules.[3] (*Temp. Himalayas.*[4])

196. **Symphoricarpos** Dill.[5]—Flowers regular; receptacle subglobose. Calyx short cupular; teeth 4, 5, equal or unequal, sometimes subnil. Corolla funnel-shaped, campanulate or suburceolate; tube short; throat glabrous or pilose; limb 4, 5-lobed, imbricate. Stamens as many short, inserted in throat; anthers introrse. Germen 4-celled; disk epigynous cupular; style straight, at apex stigmatose truncate,

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[1] *Gen.* ii. 6, n. 12.—Hook. *Fl. Ind.* iii. 17.

[2] Rather large, "white."

[3] A genus scarcely distinguishable from *Leycesteria* on the one hand; on the other closely connecting the *Lonicereæ* with the *Rubiaceæ* proper.

[4] Spec. 1 (v. 2 ?). Hook. f. et Thoms. *Journ. Linn. Soc.* ii. 165 (*Lonicera*).

[5] *Hort. Eltham.* 375.—J. *Gen.* 211. DC. *Prodr.* iv. 333.—Turp. *Dict. Sc. Nat.* Atl. t. 106.—Spach, *Suit. à Buffon*, viii. 361.—Endl. *Gen.* n. 3334.—Payer, *Organog.* 617, t. 128.—H. Bn. *Adansonia*, i. 360, t. 12.—B. H. *Gen.* ii. 4, 1227, n. 6.—*Symphoricarpa* Neck. *Elem.* n. 220.—*Symphoria* Pers. *Syn.* i. 214.—*Anisanthus* W. (ex Rœm. et Sch. *Syst.* v. xiv.).

capitellate or 2-lobed, enclosed. Ovules in anterior and posterior cells ∞, inserted 2-seriately in internal angle (sterile); in lateral cells solitary descending (fertile). Fruit fleshy,[1] globose or ovoid; putamens small. Seeds descending, albuminous; embryo minute.—Shrubs glabrous or variously clothed; leaves opposite, short-petiolate, entire (or sinuate or lobed in younger branches), exstipulate; flowers [2] in axillary and terminal glomerulate racemes or spikes. (*N. America, mount. Mexico.*[3])

197. **Alseuosmia** A. Cunn.[4]—Flowers hermaphrodite regular; receptacle subovoid; calyx equally 4, 5-lobed, deciduous. Corolla regular, tubular or funnel-shaped; lobes of limb 4, 5, valvate or induplicate; margins sinuate, denticulate or lobulate. Stamens 4, 5; filaments short or 0, inserted in throat of corolla; anthers introrse, enclosed. Germen 2-celled; disk epigynous depressed; style slender, clavate or capitate at stigmatose apex. Ovules in cells ∞, sometimes few (3, 4), inserted on placenta adnate to septum, oftener 2-seriate ascending. Fruit baccate,[5] areolate at apex; seeds ∞, or few; albumen fleshy; embryo minute.—Glabrous shrubs of various form; leaves alternate or sometimes opposite, petiolate, entire or dentate; axils of nerves protected by a tuft of hairs beneath; flowers[6] axillary and lateral, solitary or few cymose; pedicels bracteolate at base. (*N. Zealand.*[7])

198. **Lonicera** L.[8]—Flowers regular or irregular; receptacle globose or ovoid. Calyx short, persistent or deciduous; teeth 5, equal or unequal. Corolla campanulate, funnel-shaped; tube short or long, straight or curved, equal or gibbous at base; lobes of subregular, unequal or 2-lobed limb 5, short or elongate, equal or unequal, imbricate. Stamens 5, inserted in tube or under throat; filaments short or rather long; anthers introrse, 2-rimose, enclosed or exserted. Germen 2, 3-celled; disk oftener small; style slender, capitate stigmatose at apex. Ovules in cells ∞, inserted in internal angle. Fruit fleshy; cells 2, 3,

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[1] White or purplish.

[2] Small, white or pink.

[3] Spec. 5, 6. H. B. K. *Nov. Gen. et Sp.* iii. 424, t. 295, 296.—A. Gray, *Man.* (ed. 2) 164; *Smiths. Contrib.* v. 66.—*Bot. Mag.* t. 2211 (*Symphoria*), 4975.—Walp. *Rep.* ii. 446; *Ann.* ii. 732; v. 94.

[4] *Ann. Nat. Hist.* ii. 209.—Endl. *Gen.* n. 3341[1].—H. Bn. *Adansonia*, i. 368.—B. H. *Gen.* ii. 6, n. 13.

[5] "Purple."

[6] Red or greenish, sweet-scented.

[7] Spec. 4. Hook. f. *Fl. N.-Zel.* i. 102, t. 23–25; *Handb. N.-Zeal. Fl.* 109, 731.

[8] *Gen.* n. 233 (part).—Desf. *Fl. Atl.* i. 483.—DC. *Prodr.* iv. 330.—Turp. *Dict. Sc. Nat.* Atl. t. 105.—Endl. *Gen.* n. 3337.—Spach, *Suit. à Buffon*, viii. 347.—Payer, *Organog.* 617, t. 127.—H. Bn. *Adansonia*, i. 357, 376, t. 12.—B. H. *Gen.* ii. 5, n. 9.—Hook. *Fl. Ind.* iii. 9.

or from disappearance of septum, 1. Seeds ∞; albumen fleshy; embryo small.—Erect or climbing shrubs, glabrous or variously pilose; leaves opposite, petiolate or sessile or connate (*Caprifolium*[1]), entire or on some branches lobed or pinnatifid; flowers[2] in contracted cymes; cymes axillary or spuriously verticillate (*Caprifolium*), or (*Xylosteon*[3]) reduced to 2 flowers, at germens free or more or less or quite connate, stipitate or sessile; bracts free or connate under flowers. (*All warm and temp. regions of the north. hemisph.*[4])

199. **Triosteum** L.[5]—Flowers (nearly of *Lonicera*) irregular; receptacle ovoid. Calyx lobes 5, short or elongate, subulate or foliaceous. Corolla unequally tubular-campanulate; tube oblique or slightly curved, at base sometimes (anteriorly) gibbous; lobes of oblique limb 5, unequal, imbricate. Stamens 5, inserted in tube; filaments free; anthers introrse enclosed, 2-rimose. Germen inferior; disk epigynous small; style slender enclosed, at stigmatose apex depressed capitate, suborbicular or shortly 3–5-lobed. Ovules in cells 3–5, solitary, descending from top of internal angle; micropyle introrsely superior. Fruit fleshy or coriaceous, crowned with calyx. Seeds 2–5, descending, smooth angular; embryo small, albuminous.—Perennial herbs, glabrous or glandular-pilose; leaves opposite, sessile, entire, obovate or subfiddle-shaped; flowers[6] axillary solitary or glomerulate, sometimes (from leaves changed to bracts) in short compound glomerulate spikes, 2-bracteolate. (*Temp. N. America, temp. mount. Asia.*[7])

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[1] T. *Inst.* 608, t. 378.—J. *Gen.* 212.—Rœm. et Sch. *Syst.* 5, xix.—*Periclymenum* T. *Inst.* 608, t. 378.

[2] Rather large or small, white, yellow, greenish, pink or purplish, sometimes sweet-scented.

[3] T. *Inst.* 609, t. 379.—J. *Gen.* 212.—*Xylosteum* Torr. *Fl. Unit. St.* i. 242.—*Chamæcerasus* T. *Inst.* 609, t. 378.—*Nintooa* Sw. *Hort. Brit.* (ed. 2) 258.—? *Cobæa* Neck. *Elem.* n. 219 (not L.).

[4] Spec. about 75. Gærtn. *Fruct.* t. 27 (*Caprifolium*).—H. B. K. *Nov. Gen. et Sp.* t. 297.—Hook. *Fl. Bor.-Amer.* t. 100.—A. Gray, *Smiths. Contrib.* v. 66.—Jacq. *Voy. Bot.* t. 85–89.—Wight, *Ill.* t. 121, 1207; *Icon.* t. 1025.—Jaub. et Spach, *Ill. Pl. Or.* i. t. 69–73.—Reichb. *Ic. Fl. Germ.* t. 1172–1175.—Boiss. *Voy. Esp.* t. 81, 82; *Fl. Or.* iii. 4.—Hook. *Icon.* t. 806, 807.—A. Gray, *Man.* (ed. 2) 164.—Clos, *C. Gay Fl. Chil.* iii. 175.—Miq. *Fl. Ind.-Bat.* ii. 125; Suppl. 213, 537.—Benth. *Fl. Hongk.* 143.—Bedd. *Fl. Sylv.* t. 15, v.—Kurz, *For. Fl. Br. Burm.* ii. 3.—Hook. f. et Thoms. *Journ. Linn. S c.* ii. 165.—Maxim. *Bull Acad. Péters. Mél. Biol.* x. 55.—Willk. et Lang. *Prodr. Fl. Hisp.* ii. 331.—Gr. et Godr. *Fl. de Fr.* ii. 8.—*Bot. Reg.* t. 31, 70, 138, 556, 712, 1179, 1457; (1844) t. 33; (1847) t. 44.—*Bot. Mag.* t. 640, 781, 1318, 1753, 1965, 2469, 3103, 3316, 5709.—Walp. *Rep.* ii. 447; vi. 4; *Ann.* i. 365; ii. 783; v. 94.

[5] *Gen.* n. 134.—J. *Gen.* 211.—Gærtn. *Fruct.* i. 129, t. 26.—Lamk. *Ill.* t. 150.—Poir. *Dict.* viii. 108.—DC. *Prodr.* iv. 329.—Spach, *Suit. à Buffon*, viii. 328.—Endl. *Gen.* n. 3338.—H. Bn. *Adansonia*, i. 359.—B. H. *Gen.* ii. 4, 1227, n. 5.—Hook. *Fl. Ind.* iii. 8.

[6] Whitish, yellow, or purple.

[7] Spec. 3, of which 1 Asiatic. Sweet, *Br. Fl. Gard.* ser. 2, t. 45.—Wall. *Roxb. Fl. Ind.* ii. 180.—Bigel. *Med. Bot.* t. 9.

200. **Linnæa** Gron.[1]—Flowers regular or irregular; receptacle ovoid or oblong, compressed.[2] Calyx lobes 2–6, free or connate at base, persistent or deciduous, oftener narrow. Corolla funnel-shaped, tubular or subcampanulate, regular or irregular, equal or gibbous at base; lobes 5, equal or unequal, imbricate. Stamens 4, unequal or sub-2-dynamous or subequal; anthers introrse, enclosed or exserted. Germen 3-celled; style slender, at apex stigmatose capitate sometimes obtusely 3-lobed, exserted. Ovules in 2 cells ∞; in third 1, descending; raphe dorsal.[3] Fruit subglobose (*Eulinnæa*) or narrow oblong or flask-shaped and crowned with calyx (*Abelia*[4]), coriaceous-fleshy, 3-celled; 2 cells effete, the third 1-spermous. Seed albuminous; embryo small terete.—Erect or suberect (*Abelia*) shrubs, sometimes (*Eulinnæa*) creeping shrublets; leaves opposite or 3-nate, petiolate, entire or dentate, glabrous or variously pilose or glandular, exstipulate; flowers[5] at top of peduncle terminal or axillary, subsolitary, 2-nate (*Eulinnæa*) or ∞, cymose; bracteoles 2–4, either similar or dissimilar in pairs (*Eulinnæa*); 2 acute; 2 alternate broad scale-like thick glandulose-pilose and adnate to germen.[6] (*All cold and temp. reg. of the north. hemisph.*[7])

XIV. SAMBUCEÆ.

201. **Sambucus** T.—Flowers regular, hermaphrodite or polygamous; receptacle ovoid or turbinate, sometimes compressed. Calyx 3–5-lobed or dentate. Corolla rotate or shortly campanulate; lobes 3–5, valvate or oftener imbricate. Stamens 5, inserted at bottom of corolla or a little higher; filaments slender, subulate, sometimes rugose; anthers subovate or oblong, oftener extrorse, 2-rimose.

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[1] *Linn. Gen.* n. 774.—J. *Gen.* 211.—Hall. *Helv.* n. 299.—Lamk. *Dict.* iii. 528; *Ill.* t. 536.—DC. *Prodr.* iv. 349.—Turp. *Dict. Sc. Nat.* Atl. t. 107.—Spach, *Suit. à Buffon*, viii. 366.—Endl. *Gen.* n. 3332.—H. Bn. *Adansonia*, i. 361.—B. H. *Gen.* ii. 5, n. 8.—*Obolaria* Sieg. *Prim.* 79.

[2] Sometimes 1-, sometimes 3-7-nerved.

[3] Sometimes finally lateral.

[4] R. Br. *Clarke's Abel Chin.* App. 376, c. icon.; *Wall. Pl. As. Rar.* i. 14, t. 15.—DC. *Prodr.* iv. 339.—Endl. *Gen.* n. 3333.—H. Bn. *Adansonia*, i 365.—B. H. *Gen.* ii. 4, n. 7.—Hk. *Fl. Ind.* iii. 9.—*Vesalea* Mart. et Gal. *Bull. Ac. Br.* xi. 242.

[5] White, pink, red or lilac, sometimes sweet-scented.

[6] ? If *Dipelta* Maxim. (*Bull. Acad. Pétersb. Mél. Biol.* x. 78) a west. Chinese plant, unknown to us, with irregular corolla and 2-dynamous stamens, is a sect. of this genus, with a 4-celled germen (of *Symphoricarpos*).

[7] Spec. about 8. Wahl. *Fl. Lapp.* 170, t. 9, fig. 3.—Hook. *Fl. Lond.* v. t. 199.—Wight, *Ill.* t. 121 (*Linnæa*).—A. Gray, *Man.* (ed. 2) 163.—Sieb. et Zucc. *Fl. Jap.* t. 34 (*Abelia*).—Lindl. *Journ. Hort. Soc. Lond.* i. 63; *Bot. Reg.* (1846) t. 8 (*Abelia*); (1847) t. 55 (*Abelia*).—*Bot. Mag.* t. 4316, 4694 (*Abelia*).—Walp. *Rep.* ii. 446; vi. 3 (*Abelia*).

Germen 3–5-celled; disk rather thick or 0; style short, 3–5-lobed. Ovules in cells solitary, descending; micropyle introrsely superior. Fruit drupaceous; pyrenes 3–5, cartilaginous. Seeds in pyrenes solitary oblong; coat thin; albumen fleshy; embryo subequal to albumen, rather fleshy; cotyledons ovoid; radicle conical superior.—Trees, shrubs or perennial herbs; branches terete; medulla copious; leaves opposite or rarely 3-nate, imparipinnate; folioles incised, serrate or laciniate; stipules at base of petiole glanduliform or minutely foliose; stipels sometimes to folioles various; flowers in dense compound cymiferous corymbs or racemes; pedicels articulate and bracteolate. (*Almost all temp. and mount. trop. reg.*)—See p. 359.

202. **Viburnum** T.[1]—Flowers (nearly of *Sambucus*) hermaphrodite or polygamous; lobes of rotate, campanulate or tubular corolla 5, imbricate. Stamens 5;[2] anthers introrse or extrorse. Germen 1-celled or more rarely 2, 3-celled; style short conical; lobes stigmatose 2, 3, minute. Ovules &c. of *Sambucus*. Fruit drupaceous; flesh sometimes scanty and coriaceous; putamen hard or parchment-like. Seed oftener 1, descending; albumen fleshy, sometimes ruminate, occasionally sulcate or with inflexed margins; embryo minute.—Trees and shrubs; leaves opposite or rarely 3-nate, petiolate, entire, dentate or serrate; stipules large, small or 0; flowers[3] in terminal and axillary compound cymiferous corymbs; pedicels articulate, 1, 2-bracteolate.[4] (*Temp. and frigid reg. of north. hemisph., And. America, Antilles, Madagascar.*[5])

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[1] *Inst.* 607, t. 367.—L. *Gen.* n. 370.—J. *Gen.* 214.—Gærtn. *Fruct.* i. 133.—DC. *Prodr.* iv. 323.—Spach, *Suit. à Buffon*, viii. 306.—Endl. *Gen.* n. 3340.—H. Bn. *Adansonia*, i. 366.—B. H. *Gen.* ii. 3, n. 3.—Œrst. *Vid. Medd. Nat. For. Kjob.* (1860) 1.—Hook. *Fl. Ind.* iii. 3.—*Opulus* T. *Inst.* 607, t. 376.—*Tinus* T. *l. c.* t. 377.—Spach, *Suit. à Buffon*, viii. 315.—*Microtinus* Œrst. *l. c.* 293, t. 6, fig. 7–10.—*Solenotinus* Œrst. *l. c.* 294, t. 6, fig. 1–4.—*Oreinotinus* Œrst. *l. c.* 281, t. 6, fig. 11–25.

[2] *V. fœtente* "2-seriate" (B. H.).

[3] Small, white, yellowish or partly pink or red; with pleasant or often fœtid odour.

[4] Sect. 6 (ex Œrst.): 1, *Opulus*; 2, *Euviburnum*; 3, *Tinus*; 4, *Microtinus*; 5, *Oreinotinus*; 6, *Solenotinus*.

[5] Spec. "about 80." Pall. *Fl. Ross.* i. 38, t. 38 (*Lonicera*).—Jacq. *Fl. Austr.* t. 341; *Hort. Vindob.* i. t. 36.—Wight, *Icon.* t. 1021–1024.—Wall. *Pl. As. Rar.* t. 61, 134, 169.—Sieb. et Zucc. *Fl. Jap.* t. 37, 38.—Griseb. *Fl. Brit. W.-Ind.* 315.—A. Gray, *Man.* (ed. 2) 167.—Clos, *C. Gay Fl. Chil.* iii. 173.—Miq. *Fl. Ind.-Bat.* ii. 119; Suppl. 213, 537.—Benth. *Fl. Hongk.* 442.—Bedd. *Fl. Sylv.* t. 217.—Fr. et Sav. *Enum. Pl. Jap.* i. 199.—Hook. f. and Thoms. *Journ. Linn. Soc.* ii. 174.—Hassk. *Retzia*, i. 37.—Kurz, *For. Fl. Brit. Burm.* ii. 1.—Boiss. *Fl. Or.* iii. 3.—Willk. et Lang. *Prodr. Fl. Hisp.* ii. 330.—Reichb. *Ic. Fl. Ger.* t. 1170, 1171.—Gr. et Gdr. *Fl. de Fr.* ii. 7.—*Bot. Reg.* t. 376, 457; (1847) t. 43, 51.—*Bot. Mag.* t. 38, 2082, 2281, 6172, 6215.—Walp. *Rep.* ii. 450; vi. 7; *Ann.* i. 365; v. 96.

XV. ADOXEÆ.

203. **Adoxa** L.—Flowers hermaphrodite, 4–6-merous; receptacle hemispherical enclosing adnate base of germen. Calyx perigynous, inserted at margin of receptacle, 2, 3-lobed. Corolla rotate, inserted with calyx; tube short; lobes of limb 4–6, imbricate. Stamens as many, inserted in corolla; filaments deeply 2-fid; each bearing half an anther at apex, that is an extrorse subpeltate cell longitudinally rimose. Germen inferior at base, free above and there attenuated to a short thick style, presently 3–5-partite; branches erect rather thick, stigmatose at subtruncate apex. Ovules in (alternipetalous) cells solitary, descending; micropyle introrsely superior. Fruit drupaceous, enlarged laterally by short calyx; pyrenes 1–5, compressed cartilaginous. Seeds in pyrenes solitary, descending, much compressed; coat thin; albumen hard; radicle of minute embryo superior.—Low perennial herbs (moschate); rhizome rather tuberous creeping, scaly; aerial branches 2-leaved; "radicle" leaves petiolate, 3–5-foliolate or 2, 3-natisect; the upper 3-foliolate; segments lobed; bottom of petiole dilated to a sheath; flowers (small) in terminal cymes, very shortly stipitate or sessile; the terminal 4- or more rarely 5-merous; the peripherical 5- or more rarely 6-merous. (*North. hemisph. old and new world.*)—See p. 362.

LXIV. VALERIANACEÆ.

The most complete type of this family is not the *Valeriana* (fig. 396, 404–408) from which it derives its name, but rather *V. Jatamansi*, a plant of northern India, constituting the genus *Nardostachys* [1] (fig. 397–399). Its flowers are hermaphrodite and irregular. The receptacle is sac-like in form, the ovary being lodged in its cavity while its narrow mouth bears the calyx and corolla. The former is gamosepalous, nearly regular, with five or more deep divisions,[2] slightly imbricate. The corolla, gamopetalous, almost campanulate, is suddenly attenuated at the base to a short narrow tube, surmounted anteriorly by a slight gibbosity the base of which has an oblong glandular surface. The limb is divided into five lobes, slightly unequal, imbricate in the bud so that the anterior is generally covered by the laterals and these by the two posterior. The stamens, four in number, nearly equal, are composed of a filament [3] inserted near the base of the corolla-tube, and an introrse anther, the two cells of which, dehiscing longitudinally, are

Valeriana officinalis.

Fig. 396. Floriferous branch.

[1] DC. *Mém. Valérian.* 4, t. 1, 2; *Prodr.* iv. 624.—Spach, *Suit. à Buffon*, x. 307.—Endl. *Gen.* n. 2179.—B. H. *Gen.* ii. 153, n. 2.

[2] From six to eight, somewhat u equal.

[3] At first twice curved in contrary directions like the letter S.

free below the insertion of the filament. The inferior ovary has three cells; one, lateral, fertile, containing a descending ovule inserted at the top, anatropous, with raphe primarily dorsal [1] and micropyle interior and superior; [2] the two others, smaller, situate on the other side of the flower, sterile or containing only an imperfect ovule. The

Nardostachys Jatamansi.

Fig. 397. Flower (4/1).

Fig. 398. Diagram.

Fig. 399. Long. sect. of flower.

style, scarcely encircled at the base by a small prominence on the summit of the ovary, is slender, exserted, slightly enlarged and oblique, almost entire, at its stigmatic extremity. The fruit is dry, surmounted by the reticulate calyx, three-celled, the fertile cell containing a descending seed the coats of which cover an exalbumenous embryo [3] with elliptical cotyledons and superior radicle. The two species [4] of this genus inhabit the Himalayas. They are perennial herbs [5] the stems of which, short and thick, are covered with fibrous filaments said to represent the remains of the petioles of former leaves. The recent leaves are few, opposite, without stipules, entire, with a

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[1] A slight torsion later mostly renders it lateral.

[2] With a single incomplete coat.

[3] The colour is said to be greenish.

[4] Jones, *As. Res.* ii. 405; iv. 109 (*Valeriana*).—Roxb. *Fl. Ind.* i. 167 (*Valeriana*).—Vahl, *Enum.* ii. 13 (*Valeriana*).—Don, *Lamb. Cinchon.* 180 (*Valeriana*); *Prodr. Fl. Nepal.* 159 (*Patrinia*).—Royl. *Illustr. Himal. Pl.* t. 54.

[5] With a characteristic odour found generally in the *Valerianaceæ*.

limb of variable form. The attenuated summit of the stem or of some of its divisions is terminated by a floral group[1] resembling a capitule but in reality formed of compound cymes with short pedicels and free or slightly connate bracts.[2]

Beside *Nardostachys* is placed *Patrinia* (fig. 400), perennial herbs of central and eastern Asia, having flowers with a corolla somewhat less irregular, four stamens, a short calycinal collarette, entire or very slightly dentate, oblique or unequal; the flowers, yellow or white, united in compound corymbiform cymes with axes of various degrees much more developed. The fruit has three cells, of which only one is fertile, and is often accompanied by an accrescent orbicular bract resembling a wing.

Patrinia intermedia.

Fig. 400. Flower (♀).

In *Valerianella* (fig. 401), one species of which (known as *Mâche*) is common in France and others, particularly *V. olitoria* (Lamb's lettuce) in Britain, the organization of the flower is the same, but there are only three stamens instead of four. One of the anterior disappears with the superior, and the anterior which remains is that found on the side of the one fertile ovarian cell of the three. The calyx is short, thick, with very unequal divisions or, as in *V. coronata*, with six teeth equal or nearly so. They are annual herbs with dichotomous axes, growing in Europe, Asia, N. America and northern Africa. The inflorescences, most frequently terminal, are in compound cymes, often corymbiform.

Valerianella (*Dufresnia*) *orientalis.*

Fig. 401. Fruit.

Phyllactis comprises tropical American Valerians which, by their flower, approach very near to *Valeriana;* for the pentamerous corolla is imbricate and bears three stamens. The base of the tube is nearly regular or has an anterior gibbosity. It is surrounded by a small collarette which occupies the place of a calyx and may be dentelate or inflexed, but is oftener entire, annular or cupular. They are

[1] The flowers are red or purple.

[2] Regular or unsymmetrical.

perennial or shrubby plants of very various habit, erect or nearly stemless, stubby, with entire rosetted leaves, sometimes resembling those of the Andean Saxifrages, &c. The stems, moreover, are sarmentose, climbing, with dentate or dissected leaves. This is the case especially in those named *Astrephia*, in which also the two sterile ovarian cells are often tolerably large and finally open widely outwards.

Plectritis, annuals from the same regions, has also triandrous flowers and a small collar or calycinal cupule at the top of the ovary; but the corolla tube is prolonged anteriorly at the base to a rather long narrow spur. The sterile cells of the fruit are nerviform or project in involute wings. The leaves are entire or dentate-sinuate, and the contracted cymes are in a spikelike mass on a common axis.

In *Fedia* (fig. 402, 403) the corolla limb is more irregular than in the preceding genera. It is nearly bilabiate, and the tube bears anteriorly near the base an elliptic glandular plate, little prominent. The calyx is very irregular, short and with four or five very unequal lobes. There are only two stamens and these correspond to the two posterior of *Patrinia* and *Valerianella*. The ovary has three cells, of which one only is fertile, and is surmounted by a style the stigmatiferous extremity of which is divided into three very small branches. The only species known, *F. Cornucopiæ*, is an annual of the Mediterranean region; it has the habit of *Valerianella* and flowers in uniparous cymes the axes of which become thick and hard at the period of fructification.

Fedia Cornucopiæ.

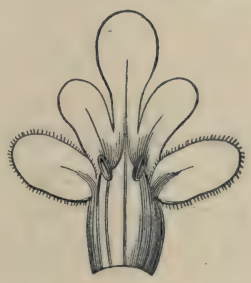

Fig. 403. Corolla opened and stamens (½).

Fig. 402. Portion of inflorescence.

The *Valerians* (fig. 396, 404–408) differ from the preceding genera chiefly by a sort of plume around the margin of the receptacle and, consequently, of the fruit, generally described as a calyx the elements of which are subdivided in strips. It is very short funnel-shaped and in one piece soon divided into a variable number of subulate plumose strips, at first closely involute, finally spread open and assisting the dissemination of the ripe and dry fruit. The corolla is irregular, more or less gibbous anteriorly at the base, with a limb of five divisions (more rarely four or six), imbricate in the bud, and the

stamens are three in number as in *Valerianella*, that is the posterior is wanting and also one of those alternating with the anterior lobe of the corolla ; more rarely the andrœcium is composed of one or two

Valeriana officinalis.

Fig. 404. Flower (½).

Fig. 405. One half of flower.

Fig. 406. The other half of flower.

pieces only. The ovary has only one fertile cell containing a descending ovule with micropyle primarily superior and interior; the other two are nervelike or almost invisible. They are rarely found in the monospermous fruit, the seed of which is descending, generally with-

Valeriana officinalis.

Fig. 407. Fruit (½).

Fig. 408. Long. sect. of fruit.

out albumen, enclosing a fleshy embryo with more or less flattened cotyledons and superior radicle. They are annual or perennial herbs, sometimes frutescent at the base, various in form like *Phyllactis*, rarely climbing, with leaves opposite, entire, pinnatifid or two or three times pinnatisect, sometimes biform in one and the same species; flowers hermaphrodite or unisexual disposed in compound terminal

cymes, occasionally racemiform or spikelike. They inhabit all the cold and temperate regions of the northern hemisphere, both old and new world, and those of the southern hemisphere in America.

Centranthus ruber.

Fig. 409. Flower, ovary and spur opened.

Centranthus (fig. 409) comprises *Valerians* whose andrœcium is generally reduced to a single stamen, that of the two laterals situate on the side of the fertile ovarian cell. The corolla has a bilabiate limb, a narrow tube prolonged anteriorly at base to a long and slender spur, and a sort of partition dividing the tube to a considerable extent into two narrow compartments, through one of which pass the style and fertile stamen, whilst the other is continued downwards into the spur. *Centranthus* comprises annual or perennial herbs of the Mediterranean region, with opposite, entire or partly dentate or pinnatisect leaves, and flowers in compound terminal clusters of cymes.

This small family was not admitted by A.-L. de Jussieu; he placed [1] *Valeriana*, by him confounded with *Valerianella*,[2] among the *Dipsaceæ*, with which they have many affinities. It was A.-P. de Candolle who, in 1815,[3] established a family of *Valerianeæ*,[4] the study of which he followed up in a special Memoir,[5] and in which he included eleven genera: *Patrinia*, *Nardostachys*, *Dufresnia*, *Valerianella*, *Astrephia*, *Fedia*, *Plectritis*, *Centranthus*, *Valeriana*, *Betckea* and *Triplostegia*. Three of these are, in our opinion, duplicate, and *Triplostegia* has been referred to the true *Dipsaceæ*. The successors of De Candolle have very slightly modified the constitution of this family.[6] Messrs. Bentham and Hooker[7] retain nine genera and

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[1] *Gen.* (1789) 195.

[2] Adanson had, however, in 1763 (*Fam. des Pl.* ii. 152), distinguished *Fedia* from *Valeriana*; he also placed in this same section his *Polypremum* (*Valerianella*).

[3] *Fl. Franç.* (ed. 3) v. 232.

[4] *Valerianeæ* DC. *Prodr.* iv. (1830) 623, Ord. 99.—*Valerianaceæ* Lindl. *Veg. Kingd.* (1846) 697, Ord. 270. In 1811, Dufresne had published his well-known monograph: *Histoire Naturelle et Médicale de la Famille des Valérianées* (Montpellier, 4to).

[5] *Notice sur la Famille des Valérianées* (1832).

[6] K. *Desvx. Journ. Bot.* ii. 174.—Bartl. *Ord. Nat.* 130.—Endl. *Gen.* 350, Ord. 118.

[7] *Gen.* ii. 151, Ord. 85.

estimate the number of species at about three hundred. They are plants of the cold and especially temperate regions of the northern hemisphere, particularly of the old world, less abundant relatively in N. America. S. America, chiefly in the western and Andean regions, is rich in *Valeriana*, *Plectritis* and *Astrephia*. There are few *Valerianaceæ* in the eastern part of S. America and the Antilles, or in tropical Asia. The genera *Nardostachys* and *Patrinia* belong to the central temperate regions of Asia and the extreme East. The *Valerianaceæ* observed in southern Africa are introduced *Valerianellas* and *Valeriana capensis*, of the indigenous character of which doubts have been expressed. Not a plant of this family, it is said, is known to be spontaneous in Australia. Europe possesses only the three genera *Valeriana*, *Valerianella*, and *Centranthus*.

Affinities.—The *Valerianaceæ* have naturally close affinities with the *Dipsaceæ*, since they have been ranged in the same family. They are nearly always distinguished by their tricarpellar gynæcium and by the absence in the *Dipsaceæ* of the rudimentary cells with or without aborted ovules. The albumen in the seed of the *Dipsaceæ* is completely wanting or nearly so in the *Valerianaceæ;* the latter, though their flowers may be accompanied with bracts more or less united or accrescent, have not the true involucel which surrounds the flowers of the *Dipsaceæ*. A character is also not unreasonably derived from the odour, ordinarily fœtid and easily recognizable, possessed by the *Valerianaceæ*. As the corolla of the latter is almost always irregular,[1] and as the stamens are always inferior in number to the divisions of the corolla,[2] we shall find the types of the *Rubiaceæ* most analogous to the *Valerianaceæ* not among the first twelve series of that family,

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[1] On the disposition of the parts, see Payer, *Organog.* t. 130.—Eichl. *Bluthendiagr.* i. 275. This disposition is always easily derived from that of the flower of *Nardostachys*, as given in fig. 398 (p. 505). Normally the anterior division of the corolla, corresponding to the spur when it exists, is covered by the two adjacent lobes, and these again by the two posterior. There are frequent anomalies; but the anterior lobe of *Fedia Cornucopiæ*, corresponding to the gland of the tube, is normally the same though Eichler (*loc. cit.* fig. E) has represented it as covering. In *Centranthus*, the tube which encloses the stamen and style corresponds, not to this lobe, but to lobe 1 of the quincunx, that of the two posterior which covers the other. The fertile cell of the gynæcium is never in the plane of the symmetry which would pass through the middle of the spur, but is lateral and normally situate on the side on which the stamens are most numerous.

[2] The androecium is also derived from that of *Nardostachys*, where, with five lobes to the corolla, there are four stamens. That which

but in the *Lonicereæ* in which there are ordinarily irregular corollas, a style with entire or little-divided stigmatiferous extremity, stamens often to the number of four and unequal, with five divisions of the corolla and also a single descending ovule, with dorsal raphe, like the *Valerianaceæ*. But the *Lonicereæ* have an abundant albumen, as in most *Rubiaceæ* proper, among which, it may be remarked, are observed plants which, by their fœtid odour, are analogous to the *Valerianaceæ*.[1] The latter, moreover, are not arborescent plants; their stems[2] are herbaceous or much more rarely frutescent.

Uses.[3]—The odour of the *Valerianaceæ* is nearly always characteristic, with some variation; generally fœtid, sometimes more or less agreeable. It is due to the essence of Valerian or some analogous substance. This essence, as obtained by distillation, contains a resin a camphor analogous to the Borneo, valeric acid, valerol and borneene, a carburet of hydrogen. The most extensively used of the Valerians, chiefly as an antispasmodic medicine in various nervous affections, fevers, worms, &c., is *V. officinale*[4] (fig. 396, 404–408), of which the subterranean portion only is prescribed. The Great Valerian (*V. Phu*[5]) was considered useful among the ancients, and its properties are in fact the same, though less energetic; but many authors have thought that the species extolled by Dioscorides was a different plant

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would alternate with the two posterior lobes is wanting. The stamens disappear in order starting from the anterior lobe; the two anterior (*Fedia*) or one of them (*Valeriana*, *Valerianella*), or, besides the two anterior, one of the two lateral, that which is not on the side of the fertile ovarian cell (*Centranthus*).

[1] Several *Viburnums* are said to contain Valeric Acid.

[2] The stems are very variable in form and dimensions; there are "stemless" *Valerianaceæ*, that is with very short stems, and others with long slender climbing stems. Several of these stems have been anatomically described in a memoir by M. J. Chatin, who notes, among other discoveries, a "general cortical system without liberian fibres." The rest much resembles the anatomical studies of M. A. Chatin.

[3] Endl. *Enchirid.* 227.—Lindl. *Veg. Kingd.* 698; *Fl. Med.* 471.—Guib *Drog. Simpl.* (ed. 7) iii. 67.—Rosenth. *Synops. Plant. Diaphor.* 253.

[4] *V. officinalis* L. *Spec.* 45.—Dufr. *Valér.* 40.—Blackw. *Herb.* t. 171.—Woodw. *Med. Bot.* i. 196.—Hayn. *Arzn. Gew.* iii. t. 32.—DC. *Prodr.* iv. 641, n. 80.—Mér. et Del. *Dict. Mat. Méd.* vi. 830.—Pierlot, *Not. sur la Valériane.*—Guib. *Drog. Simpl.* (ed. 7) iii. 68, fig. 590.—Gren. et Godr. *Fl. de Fr.* ii. 54.—Berg et Schm. *Darst. Off. Gew.* t. 28, d.—Hanb. et Flück. *Pharmacog.* 337.—Caz. *Pl. Méd. Indig.* (ed. 3) 1080.—*V. excelsa* Poir. *Dict.* vii. 301.—*V. altissima* Mik. *Besser Enum.* 4.—*V. repens* Host. *Fl. Austr.* i. 35 (*Wild Valerian, Small Valerian.*—*V. sylvestris, Phu germanicum, Phu parvum* off.).

[5] L. *Spec.* 45.—Hayn. *loc. cit.* t. 33.—Guib. *loc. cit.* 71.—Gren. et Godr. *Fl. de Fr.* ii. 54 (*Great Valerian, Garden V.*).

from that named *V. Dioscoridis*.[1] *V. dioica*,[2] a small species from our marshy fields, may be employed in the same way as *V. officinalis*; as also may *V. pyrenaica*,[3] *tuberosa*,[4] *tripteris*,[5] *montana*,[6] *italica*,[7] *asarifolia*,[8] *sambucifolia*,[9] *saxatilis*,[10] European species, *V. capensis*,[11] *V. japonica*,[12] *Wallichii*,[13] and *Hardwickii*,[14] Indian species, and *V. sitchensis*,[15] from N. America. *V. celtica*,[16] *saliunca*,[17] and some others, constitute the Celtic Nard, a medicine formerly celebrated, a constituent of Theriaca and still employed as a perfume, but must not be confounded with the Indian Nards. The latter are distinguished as the true Nard, which is the stock of *Nardostachys Jatamansi*[18] (fig. 397–399), a precious perfume and stimulant medicine, formerly esteemed, for which was often substituted the false Nards, attributed to another *Nardostachys*[19] from the same countries and even to some Valerians. *Centranthus ruber*[20] (fig. 409) is said to have the same properties as the Valerians;[21] its young shoots are sometimes eaten.

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[1] Sibth. et Sm. *Fl. Græc.* i. 24, t. 33.—Lindl. *loc. cit.* 472.

[2] L. *Spec.* 44.—Dufr. *Valér.* 29.—Hayn. *loc. cit.* t. 31.—Poit. et Turp. *Fl. Par.* t. 41.—Gr. et Godr. *loc. cit.* 55.—*V. sylvestris* Gray.—*V. montana* Wahl. (*Small V. Marsh V.—Phu minor, V. palustris* off.)

[3] L. *Spec.* 636.—Sow. *Engl. Bot.* t. 1591.—DC. *Prodr.* iv. 636, n. 42.—Gren. et Godr. *loc. cit.* 55.—Pluk. *Almag.* t. 232, fig. 1.

[4] L. *Spec.* 46.—DC. *Prodr.* n. 46.—Gren. et Godr. *loc. cit.* 55.

[5] L. *Spec.* 45.—Jacq. *Fl. Austr.* t. 268.—DC. *Prodr.* n. 41.—*V. intermedia* Vahl.

[6] L. *Spec.* 45.—DC. *Prodr.* n. 34.—*V. cuspidata* Bertol.—*V. intermedia* Sternb.

[7] Lamk. *Ill.* i. 92.—DC. *Prodr.* n. 43.—*V. tuberosa* Imp. *Hist. Nat.* (ed. 2) 656 icon.

[8] Dufr. *Valér.* 44.

[9] Mik. *Rœm. et Sch. Syst.* i. 351.

[10] L. *Spec.* 45 (not Lap. ?).—Jacq. *Fl. Austr.* t. 267.—DC. *Prodr.* n. 35.

[11] Thunb. *Fl. Cap.* 33.—Harv. and Sond. *Fl. Cap.* iii. 40. (Its indigeneity at the Cape is doubtfully revoked.)

[12] Bl. ex Rosenth. *op. cit.* 256.

[13] DC. *Not. Valér.* t. 4; *Prodr.* n. 75.

[14] Wall. *Roxb. Fl. Ind.* i. 466.—DC. *Prodr.* n. 76.—*V. Hardwickiana* Rœm. et Sch. *Mantiss.* i. 259.—? *V. elata* Don, *Prodr. Fl. Nepal.* 159 (ex DC.).

[15] Bong. ex Rosenth. *op. cit.* (A species considered very active by the Russians.)

[16] L. *Spec.* 46.—Jacq. *Coll.* i. t. 24, fig. 1.—Dufr. *Valér.* 47.—DC. *Prodr.* iv. 636.—Mér. et Del. *Dict. Mat. Méd.* vi. 828.—Guib. *loc. cit.* 71, fig. 591.—Rosenth. *op. cit.* 255.—*V. saxatilis* Vill. (ex Poir.). (*Spica celticæ* off.)

[17] All. *Fl. Pedem.* i. 3, t. 70, fig. 1.—DC. *Prodr.* n. 37.—*V. supina* DC. (not Jacq.).—*V. celtica* Vill. (not L.) *Dauph.* ii. 285. (Its presence in *Narda celtica* has been questioned.)

[18] DC. *Not. Valér.* t. 1; *Prodr.* iv. 624, n. 1.—Royle. *Ill. Himal.* 243, t. 54.—Lindl. *Fl. Med.* 471.—Guib. *loc. cit.* 74, fig. 592, 593.—Rosenth. *op. cit.* 253.—*V. Jatamansi* Jon. *As. Res.* ii. 405; iv. 109.—Lamb. *Ill. Cinch.* 177 (1797).—*V. Spica* Vahl, *Enum.* ii. 13 (1806).—*Patrinia Jatamansi* Don, *Prodr. Fl. Nepal.* 159.—*Nardus* Garc. *Arom.* 133.—*N. indica* J. Bauh. *Hist.* iii. p. ii. 202 (*Spica Nardi, Nardus Gangitis, Spicanard, Spikenard*).

[19] *N. grandiflora* DC. *loc. cit.* t. 2; *Prodr.* n. 2.—*Fedia grandiflora* Wall.

[20] DC. *Fl. Fr.* iv. 239.—Dufr. *Valér.* 39.—DC. *Prodr.* iv. 632, n. 3.—*C. maritimus* Gray.—*C. latifolius* Dufr.—*V. rubra* L. (part) *Spec.* 44 (*Red Valerian, Cornaccia*).

[21] These properties are ascribed to *C. angustifolius* DC. and *Calcitrapa* Dufr. (*Valér.* 39).

In Peru *Astrephia chærophylloides*[1] and *coarctata*[2] are indicated as antispasmodic and vulnerary. *Valerianella*, the leaves of which are generally soft and insipid, is scarcely used except as a potherb, particularly *V. olitoria*,[3] and secondarily *V. coronata*,[4] *eriocarpa*,[5] *carinata*,[6] *Auricula*,[7] *dentata*,[8] *Morisonii*,[9] and *samolifolia* Bert. from Chili. The *Valerianaceæ* cultivated as ornamental are *Centranthus*, *Valeriana*, *Fedia* and *Patrinia*. *Centranthus ruber* and *angustifolius*, chiefly the former, are considered of southern origin, but have become naturalized not only in the north of the continent, but even in England, where they remain on the walls of old edifices.

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[1] Dufr. ex DC. *Prodr.* iv. 629, n. 1.—*V. chærophylloides* Sm.—*V. laciniata* R. et Pav. *Fl. Per.* i. t. 69, fig. a.

[2] Dufr. *Valér.* 50. With De Candolle, it is a *Valeriana*.

[3] Mœnch. *Meth.* 493.—DC. *Prodr.* iv. 625, n. 1.—Gr. et Godr. *Fl. de Fr.* ii. 58.—*Fedia olitoria* Vahl.—*F. Locusta* Reichb.—*V. olitoria* W. *Spec.* i. 182 (*Lamb's lettuce*, Fr. *Mache*, Ger. *Ackersalat*).

[4] DC. *Fl. Fr.* n. 2333; *Prodr.* n. 20.—Gr. et Godr. *Fl. de Fr.* ii. 65.—*V. hamata* Bast.—*Fedia sicula* Guss.—*F. coronata* Vahl.—*V. coronata* W. (*Mâche d'Italie*, *M. couronnée*).

[5] Desvx. *Journ. Bot.* ii. 314, t. 11, fig. 2.—DC. *Prodr.* n. 9.—*Fedia eriocarpa* Rœm. et Sch.—*F. campanulata* Presl.—*F. rugulosa* Stev.

[6] Loisel. *Not.* 149.—DC. *Prodr.* n. 23.—*Fedia carinata* Stev.

[7] DC. *Fl. Fr.* Suppl. 492; *Not. Valér.* t. 3, fig. 6; *Prodr.* n. 14.—*Fedia olitoria* Gærtn. (*Oreillette*).

[8] DC. *Fl. Fr.* n. 3331; *Prodr.* n. 15.—*V. dentata* W.—*Fedia dentata* Vahl. *Enum.* ii. 20.

[9] DC. *Prodr.* n. 11.—*Fedia dentata* Bieb.—*F. dasycarpa* Stev. *Mém. Mosc.* v. 318.—*F. Morisonii* Spreng. *Pugill.* i. 4.

GENERA.

1. **Nardostachys** DC.—Flowers hermaphrodite, slightly irregular; receptacle saclike enclosing adnate germen. Calyx membranous, slightly increased after anthesis; lobes 5, imbricate. Corolla slightly irregular, sometimes (anteriorly) slightly gibbous and there having a depressed glandule; lobes 5, imbricate, finally open. Stamens 4 (posterior wanting), inserted in corolla, scarcely unequal; filaments contrariwise incurved; anthers introrse dorsifixed, exserted, 2-rimose. Germen inferior; disk epigynous subnil; style slender exserted, at stigmatose apex scarcely dilated truncate. Cells 3, of which 2 sterile, lateral; ovule very small sterile or 0. Ovule in fertile cell 1, descending from subapical placenta, anatropous; raphe dorsal, finally somewhat lateral; micropyle superior. Fruit dry, indehiscent, obconical- or ovoid-turbinate, crowned with calyx; sterile cells scarcely smaller than fertile. Seed descending exalbuminous; cotyledons of rather thick straight embryo oblong; radicle superior shorter.—Perennial herbs; stem thick (odorous) covered at base with dense fibrous persistent remains of former leaves; leaves opposite, crenate-dentate or oftener entire, exstipulate; the lower elongate; the upper in scape-like part of stem few and smaller; flowers in terminal compound-racemose subcapituliform cymes; bracts opposite, free or scarcely connate. (*Himalaya.*)—See p. 504.

2. **Patrinia** J.[1]—Flowers of *Nardostachys;* calyx small, unequal, subentire or sinuate or obtusely dentate, not enlarged. Corolla lobes 5, subequal, imbricate, open. Stamens 4[2] &c. of *Nardostachys.*

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[1] *Ann. Mus.* x. 311.—DC. *Not. Val.* 4; *Prodr.* iv. 623.—Endl. *Gen.* n. 2178.—H. Bn. *Payer Fam. Nat.* 240.—B. H. *Gen.* ii. 153, 1232, n. 1.—*Fedia* Adans. *Fam. des Pl.* ii. 152 (not Mœnch).—*Mouffetta* Neck. *Elem.* i. 124.—*Gytonanthus* Rafin. *Ann. Sc. Phys.* vi. 88.

[2] "Sometimes 2 or 5" (?).

Germen 3-celled; 2 cells sterile;[1] style subentire at apex. Fruit dry, sometimes increased laterally by an acute 2-nerved and reticulate adpressed bract; sterile cells large and subequal to or longer than the fertile one.—Perennial herbs, glabrous or villosulose; leaves opposite, once or twice pinnatifid or pinnatisect; the lower sometimes entire or subentire; flowers[2] in terminal cymiferous racemes, bracteate and bracteolate.[3] (*Cent. temp. and east. Asia.*[4])

3. **Valerianella** Mœnch.[5]—Flowers more or less irregular; receptacle saclike various. Calyx (?) short entire, sinuate or dentate, sometimes oblique or 0, generally variously increased after anthesis, open or erect, sometimes globosely inflated, regular[6] or irregular, 2–6-dentate or 3-lobate-horned, sometimes lobed in rigid or rather rigid curved, recurved or hooked awns, more rarely unchanged. Corolla more or less irregular, contracted or attenuate at base; tube short or elongate, divided or oftener obtusely gibbous;[7] lobes of limb 5, imbricate, finally open. Stamens 3, 1 anterior, 2 lateral. Germen 3-celled; 2 cells sterile; style shortly or very shortly 3-lobed at apex. Fruit dry, sometimes spongy, oftener crowned with calyx; sterile cells narrow, smaller than fertile or nervelike, contiguous or remote, sometimes equal or larger, rarely only longitudinally or introrsely contiguous (*Dufresnia*[8]). Other characters of *Patrinia*.—Annual herbs, oftener small; branches 2-chotomous; leaves inferior rosulate entire; the upper oftener smaller or partly bractlike, entire, dentate, crenate, incised or pinnatifid; flowers[9] in compound ramose corymbiform cymes, often 2, 3-chotomous, sometimes contracted and capituliform; bracts various free.[10] (*Medit. Europe, Asia and Africa, N. America.*[11])

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[1] Ovule small effete or 0.

[2] Yellow or white.

[3] Sect. 3: 1, *Eupatrinia;* 2, *Atrinia* (Ledeb.); 3, *Centronisia* (Maxim. *Bull. Acad. Pétersb.* xii. 67; *Mél. Biol.* vi. 267).

[4] Spec. 2, 3. Gærtn. *Fruct.* t. 86, fig. 3 (*Fedia*).—Thunb. *Fl. Jap.* t. 6 (*Valeriana*).—Reichb. *Icon. Exot.* t. 20, 83, 94.—Sweet, *Br. Fl. Gard.* t. 154.—Bge. *Ann. Sc. Nat.* ser. 2, vi. 70.—Fr. et Sav. *Enum. Pl. Jap.* i. 216.—*Bot. Mag.* t. 714, 2325 (*Valeriana*).—Walp. *Rep.* ii. 526; *Ann.* i. 986.

[5] *Meth.* 493 (part).—Betcke, *Anim. Valer.* (Rost. 1826).—DC. *Not. Valér.* (1832) 10, t. 3, fig. 2–10; *Prodr.* iv. 625.—Dufr. *Valer.* t. 23.—Endl. *Gen.* n. 2181.—Krok, *Monogr. Valer. K. Sw. Vet. Acad. Handl.* v. (1864) n. 1, 4 tab.—H. Bn. *Payer Fam. Nat.* 240.—B. H. *Gen.* ii. 156, n. 9.—*Polypremum* Adans. *Fam. des Pl.* ii. 152 (not L.).—*Odontocarpa* Neck. *Elem.* i. 123.

[6] In *V. coronata* equally dentate.

[7] Not spurred.

[8] DC. *Not. Val.* 8, t. 3, fig. 1 (whence fig. 401); *Prodr.* iv. 624.—Endl. *Gen.* n. 2180.

[9] Small or very small, white, pink, reddish or bluish.

[10] Sect. 2 (ex DC. B. H. and others): 1, *Siphonella* (Torr. et Gr.); 2, *Brachysiphon;* these divided into 4 series (*Locustæ, Cornigeræ, Psilocælæ, Platycælæ*).

[11] Spec. about 46. Reichb. *Icon. Bot.* t. 60–70, 113–116 (*Fedia*); *Ic. Fl. Germ.* t. 708–716.—Sibth. *Fl. Græc.* t. 34 (*Valeriana*).—Torr. *Fl. N.-York.* t. 46.—Boiss. *Diagn. Or.* ser. 2, 120;

4. **Phyllactis** Pers.[1]—Flowers nearly of *Valerianella*, oftener 3-androus. Fruit 3-celled; sterile cells narrow, nervelike or scarcely perceptible (*Euphyllactis*[2]), or more rarely subequal to the fertile one, often confluent sometimes opening outwards (*Astrephia*[3]); crowned with short or very short calyx sometimes subnil (or 0). Other characters of *Valerianella*.—Perennial herbs, erect or loosely ramose or climbing, more rarely undershrubs or (*Euphyllactis*) shrubs;[4] leaves entire, dentate, pinnatifid or once or twice pinnatisect; flowers[5] in compound more or less loosely racemose or contracted and capituliform cymes, axillary or terminal; bracts very various in form, free or connate. (*Warm and temp. N. and S. especially And. America.*[6])

5. **Plectritis** DC.[7]—Flowers (nearly of *Phyllactis* or *Valerianella*) irregular, or 3-androus; calyx very short annular or 0. Corolla tubular at base; tube long- and narrow-spurred anteriorly at base; limb scarcely irregular, 5-lobed, imbricate. Germen 3-celled; 1 cell fertile; style shortly 3-lobed at apex. Fruit dry; 2 sterile cells nervelike or dilated to short thick incurved connivent wings, attenuate at margin. Seed &c. of *Phyllactis*.—Annual herbs;[8] leaves entire, sinuate or dentate; flowers[9] terminal or axillary to upper leaves and in compound ramose contracted spikelike or capituliform cymes. (*California, Chili.*[10])

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vi. 92; *Fl. Or.* iii. 94.—Lang. *Pl. Nov. Hisp.* t. 28.—Willk. et Lang. *Prodr. Fl. Hisp.* ii. 7.—Woods, *Tr. Linn. Soc.* xvii. 421, t. 21.—Ball. *Spicil. Marocc. Journ. Linn. Soc.* (1878) 491.—Gr. et Godr. *Fl. de Fr.* ii. 58.—Fr. et Sav. *Enum. Pl. Jap.* i. 217.—Walp. *Rep.* ii. 526, 528, 944 (*Fedia*); vi. 79; *Ann.* ii. 801.

[1] *Synops.* i. 39 (1805).—B. H. *Gen.* ii. 153, n. 4.

[2] Not Wedd. (*Phyllactis* of authors).

[3] Dufr. *Val.* (1811) 50 (part).—DC. *Not. Val.* 12; *Prodr.* iv. 629.—Endl. *Gen.* n. 2182.—B. H. *Gen.* ii. 153, n. 3.—*Hemesotria* Rafin. *Ann. Phys.* vi. 88.—*Oligacoce* W. (ex Endl.).—*Porteria* Hook. *Icon.* t. 864.—Karst. *Fl. Colomb.* ii. 99, t. 151.—*Amblyorrhina* Turcz. *Bull. Mosc.* (1852) ii. 168.

[4] Very various in habit (char. not gen.): slender climbing plants, not unlike *Fumaria* or *Cardiospermum*, &c. (*P. chærophylloides*), or with habit and leaves of *Valerianella* (*P. Mandoniana*), *Mulineæ* (*P. crassipes*), *Monocotyledoneæ* (*P. rigida, bracteata*), sometimes of the small mountain *Saxifrageæ* and *Primulaceæ* (*P. aretioides*), or with short thick cordate leaves highly imbricate (*P. cordifolia*), &c.

[5] White or pink.

[6] Spec. 30–35. DC. *Prodr.* iv. 632, 633 (*Valerianæ* sect. 1, 2).—R. et Pav. *Fl. Per.* t. 65, 68, 69 (*Valeriana*).—Pœpp. et Endl. *Nov. Gen. et Sp. Pl.* t. 214 (*Valeriana*).—Hombr. et Jacq. *Voy. Pôle Sud*, t. 16 (*Valeriana*).—Wedd. *Chl. Andin.* ii. 28, t. 47.—Walp. *Rep.* ii. 528 (*Astrephia*); *Ann.* v. 157 (*Amblyorrhina*).

[7] *Not. Valér.* 13; *Prodr.* iv. 631.—Endl. *Gen.* n. 2184.—B. H. *Gen.* ii. 155, n. 8.—? *Betckea* DC. *Not. Valér.* 18; *Prodr.* iv. 642.

[8] Appearance of *Valerianella* (of which perhaps better a sect., habit peculiar ?).

[9] Pink.

[10] Spec. 3. Lindl. *Bot. Reg.* t. 1094 (*Valerianella*).—Walp. *Rep.* ii. 528, 531 (*Betckea*).

6. **Fedia** MŒNCH.[1]—Flowers irregular; calyx (?) short, unequally 3–5-dentate or lobed, not accrescent. Corolla tube slender, with an anterior sessile glandular appendage; lobes of sublabiate limb 5, imbricate.[2] Stamens 2, lateral.[3] Germen 3-celled; 2 cells sterile; style divided at apex into 3 narrow branches, slightly dilated at stigmatose apex. Fruit[4] dry; sterile cells larger than fertile, turgid and introrsely contiguous. Seed &c. of *Valerianella*.—Glabrous, 2, 3-chotomous annuals; leaves various, entire or dentate; flowers[5] in dense 1-parous terminal cymes; branches of inflorescence oftener thickened and finally hardened; bracts more or less rigid occasionally rather prominent.[6] (*Medit. reg.*[7])

7. **Valeriana** T.[8]—Flowers irregular;[9] mouth of pappus[10] of sac-like receptacle bearing ∞ (5–20), long-subulate, short and closely involuted hairs, accrete after anthesis and finally open. Corolla more or less irregular; tube short or more rarely elongate, generally gibbous or shortly spurred anteriorly; lobes of limb 5, imbricate; the anterior oftener covered by the laterals;[11] finally open. Stamens 3;[12] 2 lateral, 1 anterior.[13] Germen 1–3-celled; 2 cells sterile, oftener nervelike or subnil; ovule in fertile cell 1, descending; raphe dorsal;[14] style exserted, shortly or very shortly 3-dentate or 3-fid at stigmatose apex. Fruit dry, sometimes spongy-2-tuberculate, and crowned with pappus; sterile cells inconspicuous or 0. Seed in fertile cell descending exalbuminous;[15] radicle of fleshy embryo superior.—Perennial herbs,[16]

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[1] *Meth.* 493 (not ADANS. nor GÆRTN.).—J. *Ann. Mus.* x. 311.—DUFR. *Val.* 54, t. 1.—DC. *Not. Val.* 13; *Prodr.* iv. 630.—ENDL. *Gen.* n. 2183.—PAYER, *Organog.* 624, t. 132.—H. BN. *Payer Fam. Nat.* 240.—B. H. *Gen.* ii. 155, n. 7.—EICHL. *Bluth.* i. 275, E.—*Mitrophora* NECK. *Elem.* n. 208.

[2] The anterior generally interior to both laterals.

[3] The two anterior and the posterior wanting.

[4] Rather large.

[5] Pink or reddish.

[6] A genus in some respects very near to *Valerianella*, in others to *Centranthus*.

[7] Spec. 1. *F. Cornucopiæ* DC. *Fl. Fr.* iv. 240. REICHB. *Ic. Fl. Germ.* t. 717.—FISCH. et MEY. *Sert. Petrop.* t. 22.—BOISS. *Fl. Or.* iii. 93.—WILLK. et LANG. *Prodr. Fl. Hisp.* ii. 6.—? *F. scorpioides* DUFR.—*V. Cornucopiæ* L. *Spec.* 44.—SIBTH. *Fl. Græc.* t. 32.—*Bot. Reg.* t. 155.

[8] *Inst.* 131, t. 52 (part).—L. *Gen.* n. 44 (part).—J. *Gen.* 195.—POIR. *Dict.* viii. 293.—DC. *Not. Val.* (1832) 14, t. 4; *Prodr.* iv. 632 (part).—SPACH, *S. à Buff.* x. 307.—ENDL. *Gen.* n. 2186.—TURP. *Dict. Sc. Nat.* Atl. t. 97.—H. BN. *Payer Fam. Nat.* 241.—KROK, *Mon. Val.*—B. H. *Gen.* ii. 154, n. 5.

[9] Sometimes dicœcious or polygamous.

[10] Calyx of authors (according to most observers springing after corolla as in *Compositæ*).

[11] But sometimes exterior to one or both, the spur being superposed.

[12] Sometimes by abortion 1, 2. Pollen ellipsoid or spherical; with 3 longitudinal furrows (H. MOHL, *Ann. Sc. Nat.* ser. 2, iii. 315).

[13] The posterior and 1 of the anterior wanting.

[14] Coat simple generally very incomplete.

[15] Or with membranous albumen.

[16] Very various in form.

sometimes subshrubby, erect or more rarely climbing, sometimes shrubs, glabrous, pubescent or villose (with fœtid odour); leaves opposite, entire,[1] dentate, pinnatifid or 1- 2- or 3-pinnatisect; flowers[2] in cymes oftener terminal, compound or decompound racemose, sometimes contracted and spikelike or capituliform; bracts free or rarely connate.[3] (*Cold and temp. reg. of north. hemisph., N., And. and extra-trop. S. America.*[4])

8. **Centranthus** DC.[5]—Flowers of *Plectritis* (or *Valeriana*); corolla tube long- and narrow-spurred anteriorly to middle or below, divided internally by a vertical septum into 2 unequal cellules;[6] limb imbricate. Stamen 1,[7] lateral, exserted. Germen inferior; ovule in fertile cell 1, descending. Fruit nearly of *Valeriana*, 5–15, plumose-ciliate crowned with strips of pappus,[8] sometimes 1-nerved, sometimes rather concave, bearing nervelike sterile cells; exalbuminous seed &c. of *Valeriana*.—Annual or perennial herbs, sometimes shrubby at base; leaves entire, or lower and upper dentate or pinnatisect; inflorescences[9] compound cymose, often corymbiform (of *Valeriana*). (*Medit. reg.*[10])

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[1] Either all or the lower; the others more or less divided in the same plant.

[2] White or pink.

[3] E. g. in *V. saliunca* All. (sect. *Phuopsis* Reichb. *Ic. Fl. Germ.* xii. 28 (not Griseb.).

[4] Spec. about 120. R. et Pav. *Fl. Per.* t. 65 *a*, *b*, 66, 67, 68 *a*, 69 *b*, 70.—H. B. K. *Nov. Gen. et Sp.* t. 273–276.—Pœpp. et Endl. *Nov. Gen. et Sp.* t. 215–219.—C. Gay, *Fl. Chil.* iii. 213.—Wall. *Pl. As. Rar.* t. 263.—Wight, *Ill.* t. 129; *Icon.* t. 1043–1046.—Dcne. *Jacq. Voy. Bot.* t. 93.—Kl. *Waldem. Reis. Bot.* t. 85.—Coll. *Mem. Acad. Bonon.* xxxviii. t. 21.—Torr. *Fl. N.-York*, t. 45.—Hook. *Fl. Bor.-Amer.* t. 101.—A. Gray, *Proc. Amer. Acad.* v. 322.—Chapm. *Fl. S. Un. St.* 183.—Cav. *Icon.* t. 456.—Sm. *Ic. Ined.* t. 52.—Wedd. *Chlor. Andin.* ii. 17, t. 48, 49.—Philip. *Linnæa*, xxviii. 697; xxx. 191.—Turcz. *Bull. Mosc.* (1852) ii. 171.—Desf. *Ann. Mus.* xi. t. 28.—Harv. and Sond. *Fl. Cap.* iii. 40.—Jaub. et Sp. *Ill. Pl. Or.* t. 9.—Boiss. *Diagn. Or.* ser. 2, 117; *Fl. Or.* iii. 85.—Griseb. *Cat. Pl. Cub.* 143.—Jacq. *Fl. Austr.* t. 219, 267–269.—Reichb. *Ic. Fl. Germ.* t. 719–728; *Icon. Bot.* t. 59.—Ledeb. *Icon. Pl. Ross.* t. 19, 346, 350.—Fr. et Sav. *En. Pl. Jap.* i. 217.—Sibth. *Fl. Græc.* t. 33.—Will. et Lang. *Prodr. Fl. Hisp.* ii. 1.—Gr. et Godr. *Fl. de Fr.* ii. 54; *Bot. Mag.* t. 1825.—Walp. *Rep.* ii. 528, 944; vi. 80; *Ann.* i. 381, 986; ii. 801; v. 138 (part).

[5] *Fl. Fr.* iv. 238; *Not. Val.* 14; *Prodr.* iv. 238.—Endl. *Gen.* n. 2185.—Payer, *Organog.* 624, t. 133.—H. Bn. *Payer Fam. Nat.* 242.—B. H. *Gen.* 155, n. 6.—*Kentranthus* Neck. *Elem.* n. 207.

[6] One anterior spurred; the other postero-lateral enclosing the style and stamen.

[7] "Sometimes 2."

[8] Concerning which see Vauch. *Phys. Pl.* ii. 717.

[9] Flowers red, pink or white.

[10] Spec. 5, 6. Sibth. *Fl. Græc.* t. 29–31 (*Valeriana*).—Cav. *Icon.* t. 353 (*Valeriana*).—Rchb. *Ic. Fl. Germ.* t. 717, 718.—Mor. *Fl. Sard.* t. 78 (2).—Boiss. *Voy. Esp.* t. 85 A; *Diagn. Or.* ser. 2, ii. 119; *Fl. Or.* iii. 91.—Ball, *Journ. Linn. Soc.* xvi. 490.—Willk. et Lang. *Prodr. Fl. Hisp.* ii. 4.—Gren. et Godr. *Fl. de Fr.* ii. 52.—Walp *Rep.* vi. 80; *Ann.* i. 381; ii. 801.

LXV. DIPSACACEÆ.

I. TEAZEL SERIES.

The flowers of the Teazels [1] (fig. 410–414) are hermaphrodite and a little irregular. The receptacle is in the form of a sac with a

Dipsacus fullonum.

Fig. 411. Flower (½).

Fig. 410. Inflorescence.

Fig. 412. Long. sect. of flower.

constricted mouth and is surrounded by an involucel quite free or united with a variable extent of its surface, in a single piece, entire or denticulate at the margin, often divided into four lobes of little depth, of which two are lateral, one anterior and one posterior.

[1] *Dipsacus* T. *Inst.* 466, t. 265.—L. *Gen.* n. 114.—J. *Gen.* 194.—Gærtn. *Fruct.* ii. 39, t. 86.—Lamk. *Dict.* i. 622; Suppl. ii. 91; *Ill.* t. 56.—Coult. *Mem. Dipsac.* 21, fig. 2–4.—DC. *Prodr.* iv. 645.—Turp. *Dict. Sc. Nat.* Atl. t. 95.—Endl. *Gen.* n. 2191.—Payer, *Organog.* 629, t. 131.—H. Bn. *Payer Fam. Nat.* 244.—B. H. *Gen.* ii. 158, n. 3.—*Succisa* Gray, *Arr. Brit. Pl.* ii. 476 (not Wallr.).—*Knautia* L. *Gen.* n. 116.—Coult. *Dipsac.* 28.—DC. *Prodr.* iv. 650.—Endl. *Gen.* n. 2193. — *Pterocephalus* Vaill. *Act. Acad. Par.* (1722) 184.—Mœnch. *Meth.* 491.—Lag. *Nov. Gen.* 9.—Coult. *Dipsac.* 31, t. 1, fig. 14–17.—DC. *Prodr.* iv. 652.—Endl. *Gen.* n. 2194.—*Columbaria* Gray, *loc. cit.* ii. 476.—*Asterocephalus* Lag. *loc. cit.* 8.—*Trichera* Schrad. *Cat. Sem. Hort. Gœtt* (1814).—Coult. *Dipsac.* 28.—*Pycnocomon* Link et Hoffmg. *Fl. Portug.* ii. 93, t. 88.

Above its constricted neck, the receptacle is dilated to a small cupule which bears a short calyx with four teeth or small lobes,[1] and a gamopetalous corolla with a more or less elongate tube and a limb most frequently divided into four lobes, unequal or nearly equal, imbricate. One is anterior and covers the two lateral which ordinarily envelop[2] the posterior. The latter may be replaced by two lobes overlapping each other. The stamens are nearly always four in number, two anterior and two lateral, somewhat unequal. The place of the fifth (posterior) stamen is ordinarily void in flowers with a pentamerous corolla; sometimes however this stamen is present, similar to the others, that is composed of a filament inserted on the corolla and a bilocular, dorsifixed, introrse anther dehiscing by two longitudinal clefts and oscillant.[3] The inferior ovary is one-celled, surmounted by a slender style the stigmatiferous summit of which is divided into two short equal branches, or one shorter than the other which may even disappear altogether.[4] In the ovarian cell is a posterior placenta on the upper part of which is inserted a descending ovule, with anterior raphe and micropyle directed upwards and inwards.[5] The fruit, crowned or not with the receptacular cupule and calyx, and surrounded by the involucel which adheres for a variable extent or remains entirely free, is an achene with longitudinal ribs, most frequently eight in number. The descending seed encloses, under its very thin coats, a fleshy albumen and an embryo the oval or oblong cotyledons of which are inferior and the short radicle superior.

Dipsacus fullonum.

Fig. 413. Fruit ($\frac{5}{1}$).

Fig. 414. Long. sect. of fruit.

The Teazels are dicarpous or perennial herbs, the surface of which is covered with prickles more or less rigid, sometimes confluent, or

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[1] Entire or ciliate, lobulate, &c.

[2] Occasionally they are covered.

[3] The pollen is "ovoid;" on three sides there is a longitudinal depression, at the bottom of which is a papilla: *Scabiosa Columbaria*, *Dipsacus sylvestris*" (H. Mohl, *Ann. Sc. Nat.* ser. 2, iii. 315).

[4] The gynæcium is in reality formed of two carpellar leaves, one anterior, the other posterior, at first equal and springing at the same time, but the apical portion of one becomes more or less developed.

[5] With a simple incomplete coat.

with hairs. The leaves are opposite, penninerved, dentate or pinnatifid, connate at the base, which is dilated to a large membranous horn concave above.[1] The flowers are united in terminal capitules, ovoid or oblong, nearly globular in one species, *D. pilosus*, of which has been made a genus *Galedragon*.[2] The thick axis of these capitules bears numerous bracts, alternate, imbricate, often rigid at the summit; and each flower,[3] furnished with an involucel, occupies the aril of one of these bracts. Often those in the middle or at the top of the inflorescence expand before those at the base.[4] The ten or twelve species[5] of the genus inhabit Europe, temperate Asia and most regions of north-eastern Africa.

Scabiosa atropurpurea.

Fig. 415. Floriferous and fructiferous branch.

Scabiosa (fig. 415–422) has nearly the flowers of *Dipsacus*, having a shorter corolla tube and more open limb with four or five lobes more unequal and more developed as the flowers approach the base of the inflo-

[1] In this the rain-water collects, and the interior surface produces movable and retractile processes which Mr. F. Darwin has recently made a special object of study and which are said to be formed of protoplastic matter.

[2] Gray, *Arr. Brit. Pl.* ii. 475. (This species connects *Dipsacus* with *Scabiosa* and has also been referred to *Cephalaria*.)

[3] Blue, whitish or lilac.

[4] The blooming generally begins in the form of a ring near the middle of the inflorescence or lower, and thence proceeds upwards and downwards.

[5] Jacq. *Fl. Austr.* t. 248, 402, 403.—Tratt. *Tabul.* t. 235.—Reichb. *Icon. Fl. Germ.* t. 704-707.—Wight, *Ill.* t. 130; *Icon.* t. 1166.—Kl. *Waldem. Reis. Bot.* t. 84.—Boiss. *Fl. Or.* iii. 85.—Willk. et Lang. *Prodr. Fl. Hisp.* ii. 12.—Gren. et Godr. *Fl. de Fr.* ii. 67.—Walp. *Rep.* ii. 532; *Ann.* ii. 802.

rescence. In the very irregular corollas of the circumference, the anterior lobe is the largest and covers the lateral lobes generally more

Scabiosa atropurpurea.

Fig. 417. Fruit (¾).

Fig. 416. Corolla and stamens.

Fig. 418. Long. sect. of fruit.

developed than the one or two posterior which they overlap in the bud. The stamens are four in number, alternating with the divisions of the corolla, the posterior being absent. They are herbaceous plants, sometimes shrubby at the base, inhabiting all the temperate regions of the old world except Oceania. The flowers, each surrounded by a saclike involucel which persists around the fruit, are grouped in terminal capitules, ovoid or globular, or depressed. They are protected by an involucre the bracts of which are foliaceous in the true *Scabiosas*, and rigid, more or less dry or setaceous-acuminate in those called *Cephalaria*. The bracts under each flower higher up on the receptacle present analogous characters. In the true *Scabiosas* they are generally narrow, short, or may even disappear altogether. The involucel is very variable in the different sections of the genus (fig. 417–422), as to form, the ribs or furrows which it bears, the number and configuration of the lobes or teeth into which its orifice is divided. There is also great variation in the form, size and number of the

Scabiosa integrifolia.

Fig. 419. Fruit, with involucel laid open.

Scabiosa (Asterocephalus) columbaria.

Fig. 420. Fruit, surrounded by involucel.

Scabiosa (Succisa) uralensis.

Fig. 421. Fruit surrounded by involucel.

Fig. 422. Fruit, with involucel laid open.

divisions of the calyx which surmounts the ovary and persists above the fruit, as also in the length of its body and of the receptacular neck, sometimes very narrow and elongate (fig. 418), which supports it and emerges from the opening of the persistent involucel.

Morina (fig. 423–425) and *Triplostegia* represent two exceptional types, particularly in their inflorescence. In the former the flowers are in compound glomerules, in the axils of the opposite or verticillate

Morina longifolia.

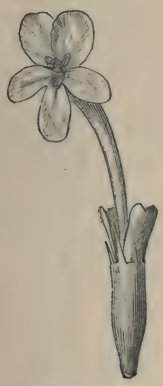

Fig. 423. Flower.

Fig. 424. Corolla and stamens.

Fig. 425. Long. sect. of fruit.

leaves ; they are irregular, each surrounded by an involucel irregularly divided with spinous teeth at its mouth ; they have a bilobed calyx, an irregular corolla supporting two stamens, or four, two of which are smaller, sterile and rudimentary, and a one-celled uniovulate ovary surmounted by a style with a stigmatiferous summit variously divided. They are Asiatic herbs most frequently ciliate or spinous. Of *Triplostegia* only one herbaceous species, Himalayan, is known, of which the habit, foliage and inflorescence are those of certain Valerians, between which and the *Dipsaceæ* this type is intermediate ; but it is now referred to the latter in preference because the ovary of its 4, 5-merous and 4, 5-androus flowers, and also the fruit are enveloped in a saclike involucel, itself surrounded by glanduliferous bracts, and because the seed has a fleshy albumen.

II? BOOPIS SERIES.

A separate family has been made of this series to which has ultimately been given the name of *Calycereæ* because it also contains the genus *Calycera*. *Boopis*[1] (fig. 426–430) has flowers similar to each other and very analogous to those of the *Dipsaceæ*. It has the concave receptacle lodging in its cavity the ovary with a single cell, near the

Boopis australis.

Fig. 426. Flower.

Fig. 428. Fruit.

Fig. 429. Seed.

Fig. 430. Long. sect. of seed.

Fig. 427. Long. sect. of flower.

summit of which is inserted a descending and anatropous ovule. It has also the superior (epigynous) perianth, composed of a short calyx with four, five or six divisions, equal or unequal and a regular gamopetalous corolla the limb of which is divided above into four, five or six equal lobes, valvate[2] in the bud. The stamens, inserted near the base of the limb, are alternate with these divisions, and are formed each of a filament, free or united with the others at the base, and a bilocular introrse anther dehiscing by two longitudinal clefts. Under the androecium, the corolla tube bears four, five or six alternipetalous, elliptic or elongate, little prominent glands. The ovule is inserted

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[1] J. *Ann. Mus.* ii. 350, t. 58, 2 (1803).—Poir. *Dict.* Suppl. i. (1810) 679.—Cass. *Journ. Phys.* (1818) 114; *Opusc. Phyt.* ii. 355.—L.-C. Rich. *Mém. Mus.* vi. 78, t. 11, 12.—DC. *Prodr.* v. 2.—Endl. *Gen.* n. 3034.—Miers, *Ann. and Mag. Nat. Hist.* (1860); *Contrib.* ii. 21, t. 46, 47.—H. Bn. *Payer Fam. Nat.* 245.—B. H. *Gen.* ii. 161, n. 1.

[2] The nervation of these lobes is peculiar and deviates from what is observed in most *Compositæ*; generally a median nerve is distinguished and two other nervures near the margins.

close to the summit of the ovarian cell, and the micropyle is directed upwards and inwards. The slender style which surmounts the ovary traverses the tube formed by the anthers and rises considerably above them; its stigmatiferous extremity is undivided and not enlarged. The fruit is an achene the pericarp of which bears as many vertical

Calycera eryngioides.

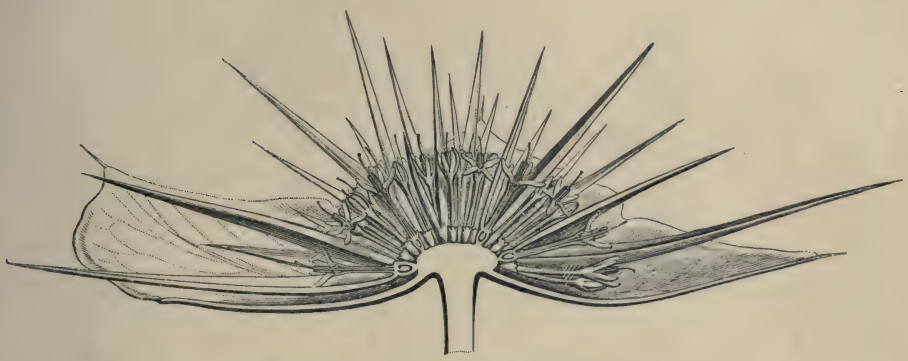

Fig. 431. Long. sect. of inflorescence (♀).

angles or short and obtuse wings as there are sepals, and is continuous with the latter which are persistent but not accrescent. The seed encloses under its coats a fleshy albumen surrounding a rather long axile embryo, the cotyledons of which are tolerably thick and the radicle, a little longer, is turned upwards. *Boopis* comprises glabrous annual or perennial herbs which, about ten in number,[1] inhabit the temperate and especially the Andean regions of South America. The leaves are alternate, without stipules; the lower ordinarily rosetted, entire, dentate or pinnatifid, sometimes slightly fleshy. The stem is prolonged upwards and most frequently bears only smaller leaves or bracts; it may even be quite destitute. The flowers[2] are described as in capitules, but they really form contracted cymes, that is glomerules,[3] each occupying the axil of one of the bracts borne by the receptacle. The latter is convex, nearly hemispherical or more

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[1] Pœpp. et Endl. *Nov. Gen. et Sp.* i. 21, t. 33.—Remy, *C. Gay Fl. Chil.* iii. 247 (*Gamocarpha*) 248.—A. Gray, *Pr c. Amer. Acad.* v. 321.—Phil. *Linnæa*, xxviii. 706.—Wedd. *Chlor. Andin.* ii. 7, t. 44.—Walp. *Ann.* i. 988; v. 142 (*Acarpha*).

[2] Small, white (or blue ?).

[3] Often 2, 3-parous.

depressed. The exterior bracts are foliaceous, united at the base;[1] the interior are much smaller and may be reduced to simple scales. In *B. scapigera*, raised to the rank of a genus under the name of *Nastanthus*,[2] the peduncles of the inflorescence are short, thick, leafless and surmounted by a single floral mass. The same is true of *B. squarrosa*, &c. of which a genus, *Acarpha*,[3] has been formed; but the peduncle bears some small leaves; the scales of the involucre are all or for the most part little developed and the angles of the fruit are prominent.

Calycera eryngioides.

Fig. 432. Long. sect. of flower (7/1).

Near *Boopis* are placed the genera *Acicarpha* and *Calycera* (fig. 431, 432), which really differ little from it. In both the glomerules are formed of flowers of centrifugal evolution, often inserted in the indentations of the receptacle; the most external of these flowers are more backward than the others and remain small or even fail to develop their female organs. In *Calycera* (fig. 431, 432), the calyx lobes or some of them are lengthened into hard spines, particularly in the sterile flowers, and are little or not at all changed in the fertile flowers. In *Acicarpha*, the interior cymes are formed of sterile flowers the ovaries of which remain completely free; whilst the fruits which succeed the fertile flowers of the periphery are more or less surrounded by the receptacle accrescent[4]

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[1] As especially in *Gamocarpha* (DC. *Prodr.* v. 2;—Endl. *Gen.* n. 3033,—Miers, *Contrib.* ii. 18, t. 45), in which the tube of the corolla is slightly enlarged at the base.

[2] Miers, *Contrib.* ii. 12, t. 43, 44.

[3] Griseb. *Beit. Pl. Phil. und Lechl.* 37 (*Abh. K. Ges. Wiss. Gött.* 1854).

[4] Unequally thickened, according to the locality.

around the hollows in which the flowers are lodged; they are also surmounted by the spines consisting of the hardened and accrescent lobes of the calyx. These two genera inhabit the same regions as *Boopis;* some of the species extend to the eastern coast of tropical Brazil.

We know that the *Dipsaceæ* were placed by A.-L. DE JUSSIEU [1] in the same family as the Valerians. VAILLANT [2] had, so to speak, established the group of *Dipsaceæ* as far back as 1722, but not precisely enough. ADANSON presented a sketch of it in 1763 under the title of *Scabiense* [3] (*Scabiosæ*). In 1823, COULTIER published his Memoir on the *Dipsaceæ*,[4] which comprises all the genera now admitted except *Triplostegia* which DE CANDOLLE [5] made known only in 1832, and which he placed among the *Valerianaceæ*. In 1873, Messrs. BENTHAM and HOOKER [6] retained only five genera of *Dipsaceæ: Triplostegia*, *Morina*, *Dipsacus*, *Cephalaria* and *Scabiosa*. The last two we have ranged in a single generic group, and we thus constitute, in the family of *Dipsacaceæ*, a first series (*Dipsaceæ*), characterized by the imbricate prefloration of the corolla,[7] the independence of the anthers, the presence of floral involucels [8] and the opposition of the leaves.

The *Boopideæ* were considered by H. CASSINI,[9] in 1816, as forming a distinct family, and it was not till the following year that R. BROWN published the work in which he gave them the name of *Calycereæ*.[10] RUIZ and PAVON had placed the first *Calycera* known among the *Dipsaceæ*, under the name of *Scabiosa*.[11] L.-C. RICHARD,[12] in 1820, published the most complete work on this group; he therein com-

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[1] *Gen.* (1789) 194, Ord. 1.

[2] Ex COULT. *Mém. sur les Dipsacées.*

[3] *Fam. des Plant.* ii. 148, Fam. 20.

[4] *Mém. Acad. Genève*, ii.

[5] The family of the *Dipsaceæ* (*Prodr.* iv. 643, Ord. C) is divided into two tribes: 1, *Morineæ;* 2, *Scabioseæ*. This subdivision is retained by ENDLICHER (*Gen.* 353, Ord. 119) but not by LINDLEY (*Veg. Kingd.* 699, Ord. 271), who adopts the name of *Dipsacaceæ*.

[6] *Gen.* ii. 157, 1230, Ord. 86.

[7] On its development see BARNÉOUD, *Ann. Sc. Nat.* ser. 3, vi. 288.

[8] M. DUCHARTRE has studied the development of that of *Dipsacus*, in a work (*Ann. Sc. Nat.* ser. 2, xvi. 221) in which the most serious errors of observation abound and the conclusions of which are incomprehensible. COULTER, much more judicious, has understood that the involucel "is not necessarily monophyllous," and has seen that it sometimes encloses more than one flower. We have then a small floral group of the category of axillary cymes corresponding to the partial glomerule of the *Boopideæ*. (See *Bull. Soc. Linn. Par.* 226.)

[9] *Compt. Rend. Acad. Sc.* (26 August, 1816); *Dict.* v. 26, Suppl. i. 32.

[10] *Trans. Linn. Soc.* xii. 132; *Misc. Works* (ed. BENN.), ii. 307.

[11] *Fl. Per.* i. 49, t. 76 (1798).

[12] *Mémoire sur une Famille de Plantes dites les Calycérées* (*Mém. Mus.* vi. 28). DE CANDOLLE (*Prodr.* v. 1) and ENDLICHER (*Gen.* 503) have retained the name of *Calycereæ*, and LINDLEY (*Veg. Kingdom*, 70) established that of *Calyceraceæ*.

prised the three genera *Calycera*, *Boopis* and *Acicarpha*, the only ones we retain. With us they constitute a second (?) series (*Boopideæ*), connecting the true *Dipsaceæ* with the *Compositæ*, and characterized by the valvate prefloration of the corolla, the syngenesis of the stamens, the absence of floral involucels and the alternation of the leaves.

All the plants of this family have as constant characters the descending direction of the ovule,[1] which separates them from the *Compositæ*, and the presence of an albumen [2] in the seeds, which distinguishes them from the *Compositæ* and from the *Valerianaceæ*. The *Boopideæ* inhabit all the extra-tropical regions of South America and are almost all western and Andean; but some of them extend to the eastern coast of tropical Brazil. The *Dipsaceæ*, on the contrary, are all natives of the old world and are not found in America (or in Oceania) except where they have been introduced. They are found dispersed throughout Asia, Africa and Europe; but they abound especially in the Levant and Mediterranean region.

Uses.[3]—These are few. The Fuller's Teazel (*Dipsacus fullonum* [4]) is celebrated as an industrial plant; it was introduced from the south of Europe, where it is said to be indigenous, and has been long cultivated for its fructiferous capitules used for carding and combing cotton and woollen tissues. In Russia, where it is also cultivated, an extract is prepared which has the reputation of curing madness. A belief existed that the water accumulated in the hollows formed by the union of the leaves in several species of *Dipsacus* was a cure for sore eyes, not to speak of other fables.[5] *D. pilosus*,[6] *laciniatus* [7] and *sylvestris*,[8] are described as diuretic and sudorific. Several *Scabiosæ* have also passed as remedies for madness. *Scabiosa Succisa* [9] is said to be

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[1] It is never inserted exactly at the summit (*i. e.* suspended) but a little eccentric.

[2] Thick or thin in the *Dipsaceæ*. Correa discovered it in the *Boopideæ*.

[3] Endl. *Enchirid.* 230.—Lindl. *Veg. Kingd.* 700.—Rosenth. *Syn. Pl. Diaphor.* 256.

[4] Mill. *Dict.* n. 1.—DC. *Prodr.* iv. 645, n. 4.—Gren. et Godr. *Fl. de Fr.* ii. 68.—Guib. *Drog. Simpl.* (ed. 7) iii. 66.—Caz. *Pl. Méd. Indig.* (ed. 3) 276.—*D. sativus* Gmel.—*D. sylvestris* (var.) Coult.

[5] A caterpillar which ate the inflorescence was considered a cure for toothache. Cazin states that he employed this remedy with success.

[6] L. *Hort. Upsal.* 25.—Jacq. *Fl. Austr.* t. 248.—DC. *Prodr.* n. 9.—*Cephalaria pilosa* Gr. et Godr. *Fl. de Fr.* ii. 69.—*C. appendiculata* Schrad. (type of the genus *Galedragon*).

[7] Link, *Spec.* 141.—DC. *Prodr.* n. 2.—*D. sylvestris* (var.) Coult.

[8] Mill. *Dict.* n. 2.—Jacq. *Fl. Austr.* t. 402.—Gren. et Godr. *Fl. de Fr.* ii. 67.—*D. vulgaris* Gmel.

[9] L. *Spec.* 142.—DC. *Prodr.* iv. 660, n. 38.—Gren. et Godr. *Fl. de Fr.* ii. 81.—Guib. *loc. cit.* 67.—*Succisa pratensis* Mœnch, *Meth.* 489.—*Asterocephalus Succisa* Wallr. (*Devil's bit.*)

poisonous; it has also been noted as a febrifuge. It is a tinctorial plant yielding a greenish colour and is sufficiently astringent to be used in tanning skins. *S. arvensis*[1] has been recommended in pulmonary and scorbutic[2] diseases, as also *S. sylvatica*[3] and *Columbaria*.[4] *S. cochinchinensis*[5] used to be employed as a country medicine, and *S. centauroides*[6] was considered antisyphilitic and antiscorbutic. *S. atropurpurea*[7] and some other species are frequently cultivated in our gardens, as also several species of *Dipsacus*, highly ornamental plants and furnishing elegant models for decorative art. No particular properties are known of the *Boopideæ*.

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[1] L. *Spec.* 142.—*S. polymorpha* SCHM.—*Trichera arvensis* SCHRAD.—*Knautia arvensis* COUL. *Dips.* 29.

[2] Whence *Scabiosa*, from *scabies*, scab.

[3] L. *Spec.* 142.—*S. integrifolia* SAV.—*S. ovatifolia* LAGASC.—*Knautia sylvatica* DUB. *Bot. Gal.* i. 257.—*Trichera sylvatica* SCHRAD.

[4] L. *Spec.* 143.—*Asterocephalus Columbaria* WALLR. *Sched. Crit.* 48.

[5] LOUR. *Fl. Cochinch.* (ed. 1790) 68.

[6] LAMK. *Ill.* n. 1312.—*S. transylvanica* ALL. *Fl. Pedem.* n. 504.—*Cephalaria centauroides* COULT. *Dipsac.* 25, t. 1, fig. 8.—DC. *Prodr.* 648, n. 7.—*Succisa ambrosioides* SPRENG.—*Lepidocephalus centauroides* LAGASC.

[7] L. *Spec.* 144.—CURT. *Bot. Mag.* t. 247.—? *S. maritima* L. (var.)?—*Succisa atropurpurea* MŒNCH.—*Sclerostemma atropurpurea* SCH.—*Asterocephalus atropurpureus* SPR. (*Mournful widow.*)

GENERA.

I. DIPSACEÆ.

1. **Dipsacus** T.—Flowers hermaphrodite irregular; receptacle saclike enclosing adnate germen and bearing perianth inserted in mouth. Calyx (?) cyathiform or cupular, subentire, ciliate or oftener 4-dentate or lobed. Tube of irregular corolla straight or slightly incurved; lobes of oblique or sub-2-labiate limb 4, or more rarely 5 (2 posterior), unequal, imbricate. Stamens 4 (posterior wanting), or very rarely 5; filaments inserted on corolla, somewhat unequal; anthers introrse, versatile, exserted, 2-rimose. Germen inferior, 1-celled; style slender, simple or unequally 2-lobed at stigmatose apex. Ovule in cell 1, descending, anatropous; micropyle introrsely superior. Fruit dry indehiscent, oftener crowned with calyx, longitudinally 8-ribbed. Seed descending anatropous; albumen fleshy; embryo axile shorter than albumen; cotyledons ovate-oblong; radicle superior.—Perennial or biennial herbs, pilose or oftener hispid or aculeate; leaves opposite, sometimes connate at base in an amplexicaul sac, dentate or pinnatifid; lobes unequal, the terminal often larger; flowers in an ovoid or rarely subglobose capitule, bracteate; bracts oftener acute or spinescent, erect or recurved; the lower larger; the others shorter and thinner, 1-florous; each flower girt with an involucel clothing the germen then the fruit, 4–8-costate and dilated above to a concave dentate, lobed or lobulate limb. (*Europe, west. and mid. Asia, north. and north-east. Africa.*)—See p. 519.

2. **Scabiosa** T.[1]—Flowers (nearly of *Dipsacus*) irregular; calyx 5–∞-lobed or dentate, persistent; lobes pointless or oftener produced

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[1] *Inst.* 463, t. 263, 264.—L. *Gen.* n. 115.—Adans. *Fam. des Pl.* ii. 151.—J. *Gen.* 194.—Lamk. *Ill.* t. 57.—Poir. *Dict.* vi. 701; Suppl. v. 77.—Coult. *Mem. Dipsac.* 45, t. 2.—DC. *Prodr.* iv. 650.—Spach, *Suit. à Buffon*, x. 323.—Endl. *Gen.* n. 2195.—Payer, *Organog.* 629, t. 131.—H. Bn. *Payer Fam. Nat.* 243.—*Succisa* Gray, *Arr. Brit. Pl.* ii. 476.—Mœnch, *Meth.* 488.—Coult. *Dipsac.* 45, t. 2.—Spach, *loc. cit.* 324.—*Trichera* Schrad. *Cat. Sem. Hort. Gœtt.* (1814)

to radiating hairs. Corolla irregular;[1] lobes 4, 5, more or less unequal, imbricate. Stamens 4, or rarely 2, fertile.[2] Germen and ovule of *Dipsacus;* style slender, terminal or oblique or lateral at stigmatose apex. Fruit dry, crowned with calyx and enclosed by or adnate to 2–8-ribbed involucel. Seed &c. of *Dipsacus*.—Herbs annual, perennial or shrubby at base, pubescent, sericeous or pilose, rarely aculeolate or glabrous; leaves entire, dentate or lobed; capitules terminal, pedunculate or more rarely in sessile dichotomies; flowers[3] each clothed with its own persistent involucel, sulcate or foveolate, equally or unequally dentate or denticulate; involucre of capitule ∞-bracteate; bracts 2–∞-seriate; the exterior either herbaceous, free or connate at base (*Euscabiosa*[4]), or paleaceous, rigid or scarcely herbaceous, obtuse or setaceo-acuminate (*Cephalaria*[5]); the interior either subsimilar to exterior (*Cephalaria*), or smaller, shorter or 0.[6] (*Europe, west. and temp. Asia, north. north-east. and south. Africa.*[7])

3. **Morina** T.[8]—Flowers irregular; lobes of herbaceous, sometimes persistent, 2-labiate calyx entire or 2-lobulate. Tube of corolla slender sometimes very elongate; lobes of oblique or 2-labiate limb 5, unequal,

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ex Coult. *Dipsac.* 28.—*Knautia* L. *Gen.* n. 116. —Coult. *loc. cit.* 40, t. 1, fig. 10–13.—DC. *Prodr.* iv. 650.—Endl. *Gen.* n. 2193.—*Asterocephalus* Lagasc. *Nov. Gen. et Sp.* 8.—*Pterocephalus* Mœnch. *Meth.* 491.—Lagasc. *loc. cit.* 9.—Coult. *loc. cit.* 43, t. 1, fig. 14–17.—Endl. *Gen.* n. 2194. —*Columbaria* Gray, *Arr.* ii. 476.—*Pycnocomon* Link et Hfmsg. *Fl. Portug.* ii. 93, t. 88.—*Cyrtostemma* Koch (ex Spach, *loc. cit.* 321).—*Callistemma* Boiss. *Fl. Or.* iii. 146.

[1] In the interior flowers generally less irregular.

[2] Pollen various, according to H. Mohl, ovoid (*Columbaria*) or spherical and minutely aculeate (*Knautia*), sometimes (*Asterocephalus*) rather flat, obtusely 3-gonal; angles truncate papillose. (H. Mohl, *Ann. Sc. Nat.* ser. 2, iii. 315.)

[3] White, ochreous, pink, lilac, azure or dark purple.

[4] *Scabiosa* (B. H.).

[5] Schrad. *Ind. Sem. Hort. Gœtt.* (1814).—Coult. *Dipsac.* 36, t. 1, fig. 5–9.—DC. *Prodr.* iv. 647.—Endl. *Gen.* n. 2192.—B. H. *Gen.* ii. 159, n. 4.—*Lepicephalus* Lagasc. *loc. cit.* 7.—*Succisa* Walle. *loc. cit.* 46 (not Gray).

[6] *Euscabiosa.*

[7] Spec. about 100. Jacq. *Fl. Austr.* t. 362, 439; *Hort. Vindob.* t. 111.—Sibth. *Fl. Græc.* t. 103–114.—Reichb. *Ic. Fl. Germ.* t. 674 (*Pterocephalus*), 676–683, 684 (*Asterocephalus*), 697–703 (*Succisa*); *Iconogr.* t. 121, 314, 315 (*Succisa*), 273, 326; *Icon. Exot.* t. 16, 17.—Webb, *Phyt. Canar.* t. 80, 81.—Harv. and Sond. *Fl. Cap.* iii. 41 (*Cephalaria*), 43.—Tchihatch. *As. Min.* t. 26 (*Cephalaria*), 27 (*Pterocephalus*).—Boiss. *Fl. Or.* iii. 117 (*Cephalaria*), 126 (*Knautia*), 130, 147 (*Pterocephalus*).—Willk. et Lang. *Prodr. Fl. Hisp.* ii. 13 (*Cephalaria*), 14 (*Knautia, Tricera*), 16 (*Pterocephalus*), 17.—Gr. et Godr. *Fl. de Fr.* ii. 69 (*Cephalaria*, part), 71 (*Knautia*), 75.—*Bot. Mag.* t. 247, 886.—Walp. *Rep.* ii. 532 (*Cephalaria*), 533 (*Knautia*), 534 (*Pterocephalus*); vi. 84 (*Cephalaria*), 85 (*Knautia, Pterocephalus*), 86; *Ann.* ii. 803 (*Cephalaria, Knautia*), 804 (*Pterocephalus*), 805; v. 140 (*Cephalaria*), 141, 142 (*Succisa*).

[8] *Inst. Cor.* 48, t. 480.—L. *Gen.* n. 41.—J. *Gen.* 194.—Lamk. *Dict.* iv. 313.—Coult. *Dipsac.* 33, t. 1, fig. 1.—DC. *Prodr.* iv. 644.—Spach, *Suit. à Buffon*, x. 314.—Endl. *Gen.* n. 2190.—H. Bn. *Payer Fam. Nat.* 243.—B. H. *Gen.* ii. 158, n. 2.—*Diototheca* Vaill. *Mém. Acad. Par.* (1722) 184.—*Asaphes* Spreng. *Syst. Cur. Post.* 222.

imbricate. Stamens 4, 2-dynamous;[1] 2 smaller, often sterile or rudimentary, sometimes 0. Germen inferior, unequal, sometimes more or less gibbous or carinate; cells 1, 1-ovulate; style slender, sometimes incurved, capitate, globose or discoid-peltate at stigmatose apex. Fruit dry, clothed with involucel, sometimes rather compressed, crowned with calyx (or, rarely, bare at apex). Seed descending, albuminous.—Perennial herbs, glabrous or pubescent; leaves opposite or verticillate; the lower often rosulate; pinnatifid or spinose-dentate[2] or ciliate; flowers[3] axillary and terminal in compound glomerules and forming verticillasters, bracteate; each clothed with an unequally spinose-dentate involucel. (*Mid. and west. Asia.*[4])

4 ? **Triplostegia** Wall.[5]—Flowers subregular; receptacle enclosing germen, and produced above to a narrow calyciform neck. Calyx short cupular, 4, 5-dentate. Lobes of corolla limb 4, 5, subequal or unequal, imbricate. Stamens 4, 5, inserted on corolla, unequal. Germen inferior, 1-celled; ovule 1, descending; style slender, capitate at stigmatose apex. Fruit dry, crowned with calyx, enclosed by involucel; seed descending albuminous.—A slender pilose or glandulose herb; rhizome slender; leaves opposite, inciso-pinnatifid; the lower subrosulate, petiolate; the upper sessile; flowers[6] in terminal, 2-chotomous compound ramose and slenderly stipitate cymes; each clothed with 4 exterior linear-lanceolate capitato-glandular[7] bracts and an interior gamophyllous, 8-costate and above minutely dentate involucel. (*Himalaya.*[8])

II ? BOOPIDEÆ.

5. **Boopis** J.—Flowers hermaphrodite or more rarely polygamous; receptacle saclike angular, enclosing adnate germen. Calyx superior short; lobes 4–6 (oftener 5), continuous with angles of receptacle,

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[1] Pollen very singular and thus described by H. Mohl (*Ann. Sc. Nat.* ser. 2, iii. 315): "ovoid, nearly cylindrical; on three sides a prominence like the neck of a bottle, across which the internal membrane is prolonged in the form of a canal," and thence everywhere figured.

[2] Of many *Carduaceæ*.

[3] Pink (or white?), showy.

[4] Spec. 6, 7. Sibth. *Fl. Græc.* t. 28.—Wall. *Pl. As. Rar.* t. 202.—Royle, *Ill. Himal.* t. 55.—Jaub. et Spach, *Ill. Pl. Or.* t. 429.—Boiss. *Diagn. Or.* ser. 2, vi. 94; *Fl. Or.* iii. 113.—Hook. *Icon.* t. 1171.—*Bot. Reg.* (1840) t. 36.—*Bot. Mag.* t. 4092.—Walp. *Rep.* ii. 532; vi. 84; *Ann.* v. 140.

[5] Ex DC. *Not. Val.* 19, t. 5; *Prodr.* iv. 642.—Endl. *Gen.* n. 2188.—B. H. *Gen.* ii. 158, n. 1.

[6] Small or minute, pink (?).

[7] Glandules dark coloured.

[8] Spec. 1. *T. glandulifera* Wall.

short, equal or unequal. Corolla regular; tube rather long, sometimes rather thicker at base; lobes of limb oftener 5, 3-nerved, valvate. Stamens as many, alternating with lobes of corolla; filaments inserted at top of tube, 1-adelphous at base, free above; anthers introrse, 2-rimose, marginally coherent in a tube traversed by the style. Glandules same in number alternating with stamens and sessile within tube. Germen inferior, 1-celled; style slender, at slender exserted stigmatose apex not or scarcely dilated or truncate entire. Ovule 1, inserted near apex of cell, descending; micropyle introrsely superior. Fruit dry, indehiscent, free, crowned with unchanged or scarcely changed calyx; pericarp longitudinally 4–6-angular, rather hard or suberose; angles continuous with persistent, rather obtuse, acute or spinescent lobes of calyx. Seed descending; albumen fleshy; embryo axile shorter than albumen; radicle superior.—Glabrous annual or oftener perennial herbs; stem ramose, sometimes foliate or oftener scapelike; lower leaves rosulate; all alternate, often rather fleshy, entire, dentate or pinnatifid; flowers in spurious capitules at top of simple or branched scape; exterior bracts pointless not accrescent, approximate or connate below in an involucre; interior paleaceous; bracts in axils each glomeruliferous; all flowers of the glomerule fertile, or more rarely the exterior male sterile. (*South-west. extratrop. And. and subtrop. east. America.*)—See p. 524.

6. **Calycera** Cav.[1]—Flowers (of *Boopis*) polygamous, 2-form in each glomerule; a few central hermaphrodite fertile; the outer (younger) often male sterile. Other characters of *Boopis*.—Annual or perennial herbs, glabrous or woolly, erect or procumbent; leaves alternate, either remote on stem, or rosulate at base, coarsely dentate or pinnatifid; inflorescence capituliform-cymose, on simple or branched peduncle; bracts of involucres free or connate at base; fruit dry, 2-form; germens of larger flowers hardened above and crowned with 2–5 hardened spinescent elongate accrescent lobes of calyx; calyx of smaller flowers scarcely or not at all changed. (*South Peru, Chili.*[2])

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[1] *Icon.* iv. (1797) 34, t. 358 (*Calicera*).—Cass. *Dict. Sc. Nat.* vi. Suppl. 36; *Journ. Phys.* (1818) 113; *Opusc. Phyt.* ii. 353.—L.-C. Rich. *Mém. Mus.* vi. 77, t. 10.—DC. *Prodr.* v. 2.—Endl. *Gen.* n. 3035.—H. Bn. *Payer Fam. Nat.* 245.—B. H. *Gen.* ii. 162, n. 2.—*Leucocera* Turcz. *Bull. Mosc.* (1848) i. 582.—*Anomocarpus* Miers, *Contrib.* ii. 27, t. 48, 49.—*Discophytum* Miers, *Lindl. Veg. Kingd.* 701 (ex B. H.).—*Gymnocaulus* Phil. *Linnæa*, xxviii. 705 (ex B. H. *Gen. loc. cit.*).

[2] Spec. 8, 9. R. et Pav. *Fl. Per.* i. 49, t. 76 (*Scabiosa*).—Remy, *C. Gay Fl. Chil.* iii. 251.—Phil. *Linnæa*, xxviii. 706.—Wedd. *Chlor. Andin.* ii. 1, t. 43.—Miers, *loc. cit.* 34, t. 50.—Walp. *Rep.* vi. 87; *Ann.* i. 988; ii. 807 (*Leucocera*).

7 ? **Acicarphâ** J.[1]—Flowers (of *Calycera* or *Boopis*) polygamous, 2-morphous, capituliform-glomerulate; exterior glomerules of inflorescence formed of fertile flowers; achenes crowned with concrete foveoles of raised receptacle and persistent accrescent hard spinescent lobes of calyx; upper glomerules composed of sterile flowers; germens not changed after floration free.—Herbs generally annual, ramose or procumbent, foliate; leaves alternate, petiolate or sessile amplexicaul, obovate, spathulate or subpinnatifid; inflorescences shortly pedunculate or sterile. (*Extratrop. west. S. America, trop. east. marit. Brazil.*[2])

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[1] *Ann. Mus.* ii. 347, t. 58, 1.—Cass. *Dict. Sc. Nat.* i. Suppl. 32.—Less. *Linnæa*, vi. 527.—L.-C. Rich. *Mém. Mus.* vi. 78, t. 11.—DC. *Prodr.* v. 3 (part).—Endl. *Gen.* n. 3036.—H. Bn. *Payer Fam. Nat.* 245.—B. H. *Gen.* ii. 162, n. 3.—*Cryptocarpha* Cass. *Bull. Soc. Philom.* (1817); *Dict. Sc. Nat.* xii. 86.—Turp. *Dict. Sc. Nat.* Atlas, t. 194.—R. Br. *Trans. Linn. Soc.* xii. 131.—*Sommea* Bory, *Ann. Gen. Sc. Phys.* vi. 92, t. 87.—*Acanthosperma* Velloz. *Fl. Flum.* Atl. viii. t. 152 (not H. B. K.).—*Echinolema* Jacq. f. (ex Endl.).

[2] Spec. 3. Poir. *Dict.* Suppl. i. 110.—Miers, *Ann. and Mag. Nat. Hist.* (1869); *Contrib.* ii. 37, t. 51, 52 (part).

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